

indian
metalware

JAMILA BRIJ BHUSHAN



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Throne and foot stool of the Maharajah of Banaras — gold enamelled and studded with precious stones

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JAMILA BRIJ BHUSHAN

1st edition 1961

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Temple bell

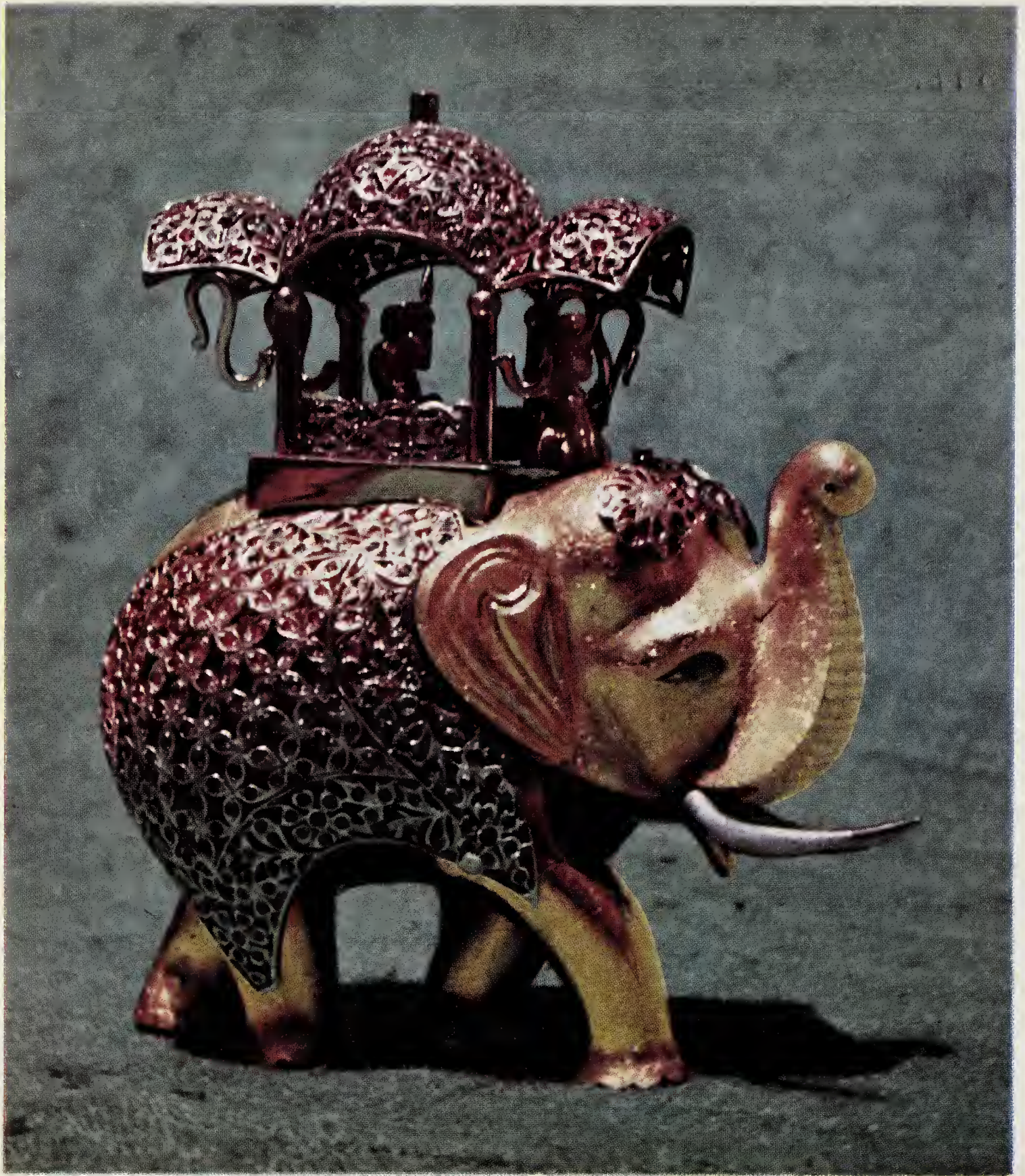
foreword

Metal figures only next to clay in the composition of the Indian crafts and has been universally used in the form of brass, copper, bell metal etc. covering a very wide range of articles from kitchenware to fine gold and enamel jewellery. The proficiency attained in metal casting by Indian craftsmen is proved by the treasures dug out in excavation operations, which also show high sophistication. So vast and varied is the range covered by metalware in India that it would be almost an impossible task to enumerate them in any comprehensive manner. Moreover each region has its own special designs and processes. In each metal again there is a wide variety. Therefore, one book, however detailed, can hardly do full justice to the subject.

It is therefore no small task that the author of this book has attempted. I would only ask the readers to seek satisfaction in the big span that has been covered rather than pick on the omissions. Pictorial literature, especially for the lay people, is scarce in this country, particularly on handicrafts. Apart from the few excellent books mostly compiled by foreigners which have come down to us and sadly enough are now out of print, we have little to tell us of our great craft heritage or teach us its many subtle beauties and cunning charms. Outside of the old Gazetteers, an unfailing and an inimitable institution, few in current years have thought it worthwhile to study and elaborate on Indian handicrafts. What is usually put out by the different states is ordinarily publicity material.

I therefore greatly welcome this book which gives a bird's eye view of the Indian metalware. I am glad the Handicrafts Board can offer one more handbook to the public on such an important craft in this country as metalware.

H. hathofadga
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*Gold elephant with stone studded
trappings—Modern Delhi work*

introduction

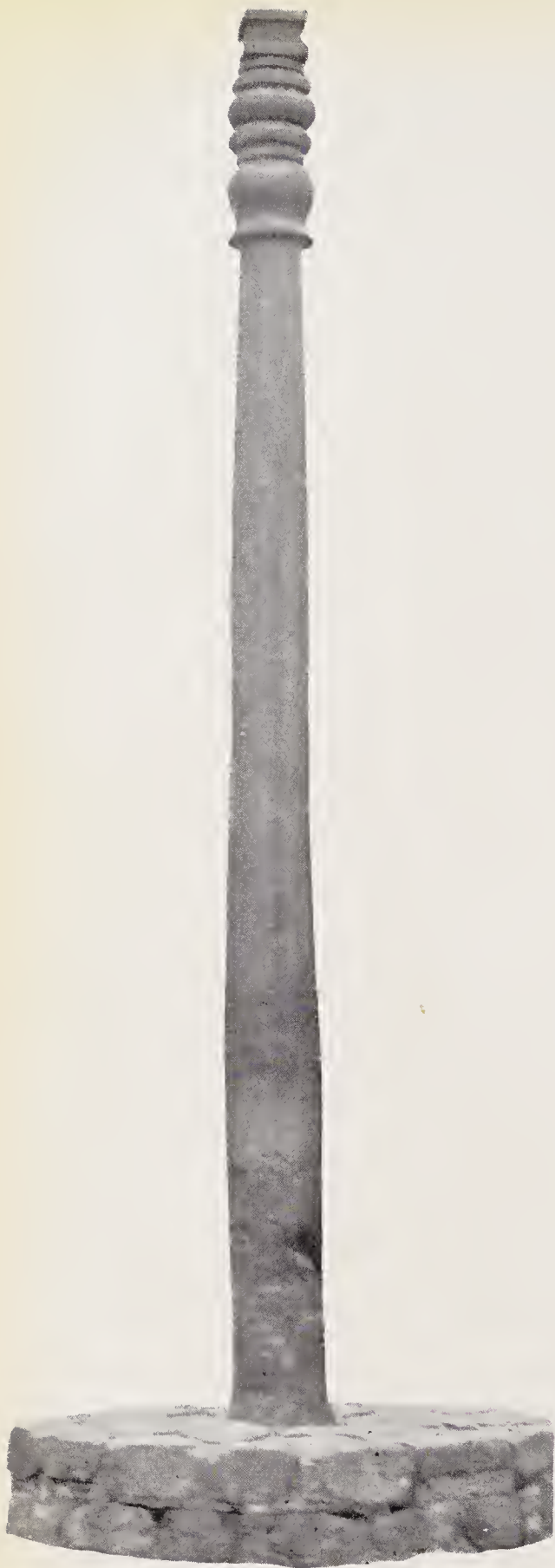
As the use of tools is one of the marks that distinguish man from the lower animals, so the use of metals may be regarded as a milestone on the road from savagery to civilisation. Gold was the first of the metals to be utilised but as its softness renders it useless for practical purposes its discovery had no inherent evolutionary importance. It is highly probable that the erroneous identifications of native copper, which is sometimes found pure in lumps of considerable size as a kind of gold, led to attempts to fashion this material into ornaments.

As copper becomes hardened by hammering and can be brought to a sharp edge, it must soon have been discovered that here was a substance with infinitely greater possibilities than stone for the making of tools and weapons. Excavations suggest that objects of copper were known in Mohenjodaro in about 1,500 B.C. and that bronze of a kind was produced by an accident of smelting in Asia Minor and Europe about 2,500 B.C.

The real Iron Age was delayed, however, until about 1,200 B.C. Iron, as at first produced, was still too soft but by the time of Homer the smiths had discovered how to harden it. Despite their considerable manufactures of iron and steel the Romans imported steel from India where the iron-workers of Hyderabad manufactured steel of a high quality from a very early date. This was the "Seric" iron referred to by Pliny.

The discovery of smelting must have been accidental and Manu states that gold and silver rose from the union of fire and water.

The ancient world, especially India and China, achieved great proficiency in the working of metals. The copper statue of the



Pillar in the courtyard of Kutb Mosque

Buddha at Sultanganj is the largest metal work of ancient times extant in India and remains a monument to the early proficiency of the Hindus in melting and casting metal. The metal pillar standing in the courtyard of the Kutb Mosque at Delhi dates from about 400 A.D. After an exposure of over 1,500 years it remains unruined and the inscription is as clear and unblurred as it was when first-made. The beautiful hammered gates of the tomb of Shah Alam at Ahmedabad are another notable example of the great skill of Indian craftsmen in metal work.

Artists used their skill in making gold and silver plate, jewellery and other objects while smiths increasingly improving their craft produced better and cheaper swords, spears, hooks, scythes and other implements—particularly of war. In the middle ages in Europe the smith was an outstanding craftsman in the manorial community and his pride in his craft is reflected in the number of families which adopted Smith as their surname.

The stimulus given to trade by the discovery of working of metals was considerable and kingdoms rose to great power on the basis of the possession of mineral and metal wealth. Even the Macedonian empire of Alexander the Great owed its rise to the mines of Thrace and among the gifts given to Alexander by Porus in India is mentioned a ton of steel.

About 700 B.C. there occurred in Asia Minor an event of great importance—the first definite issue of coins. These were probably issued first by wealthy traders who grasped the opportunity offered by the invention of a new metal currency.

Naturally, a feeling of the importance of metals and a primitive appreciation of the

‘Marvels of Science’ in connection with the working of them and of their mechanical pliability reacted powerfully upon early man. The body of beliefs about metals and minerals is enormous and survives in present psychology to this day. In Manipur, for instance, the iron-ore deposits are under the protection of an umang-lai (forest god) who is propitiated before the iron is worked. The Chinese consider ores, when in the ground, to possess a “shen” (soul) of animal or human shape.

The acoustic properties of metal have also been important in religious ritual. The idea that the sound of brass or iron has power to put spirits to flight prevailed in classical antiquity and persists even today.

The temple bells of India are celebrated for the depth and purity of their tones and those of Madras are distinguished above all others by their stately architectural forms. The handles are generally crowned with a group of Puranic gods, sculptured in relief.



Indian Coins of various periods

The so-called dark “ bronzes ” of India are not of bronze, that is, a mixture of copper and tin, which is generally considered to be impure, but of copper without any alloy.

It is probable that at first all household articles were made of pure copper but in time this partly gave way to a more gold-like alloy, brass, and later on, to bronze. Copper being first, is held to be the purest of all inferior metals. Though gradually brass came to be more and more extensively used for household articles, copper was never entirely discarded. Things in India, somehow or other, manage to get mixed up with religion and fine copper, all but discarded from every other Hindu household use, has, nevertheless, retained its place in religion and is now chiefly employed in the manufacture of sacrificial vessels. Muslims have, somehow, stuck to copper cooking and eating utensils but these are always used tinned.

The only notice of gold plate in the Rig Veda is an allusion to golden cups, but the numerous references to jewellery are evidence of the extensive use of metals in the earliest Aryan settlements in India.

Vessels made of gold, silver and inferior metals are frequently mentioned in comparatively modern works. It is interesting to note the qualities ascribed to various metals. Dr. Rajendra Lal Mitra remarks—
“ In a medieval work, the Kalika Purana, plates of gold are described to remove excesses of the three humours and promote the strength of the vision; those of silver, favourable and inimical to bile, but calculated to increase the secretion of wind and phlegm; those of bronze, agreeable and intellectual, but favourable to undue excitement of blood and bile; those of brass, wind-generating, irritating, hot and heat and phlegm destroying; those of magnetic iron, most beneficial in overcoming anasarca, jaundice and anaemia; those of stones or clay are inauspicious; those of wood wholesome, invigorating and poison-destroying.”



Another temple bell. If a wooden rod is rapidly passed over the base of the bell it produces a lingering sound like a prolonged ‘Om’



*Gold enamelled pot
for crushing pan—from Jaipur*

In India metal utensils take the place of glass, porcelain and silver plate in a European household.

The shapes of articles have their origin in shells of fruits, like those of the gourd, leaves of lotus and lily and bones and horns of animals. The orthodox still use the gourd shell (Kamandala) as a water vessel and water poured out of a rhinoceros horn is still the most acceptable to the gods.

Patterns are distinguished by the shapes of vessels, not by different styles of ornamentation, for, except a few sacrificial or Muslim vessels, no decoration is used.

Patterns distinguished by shapes generally take their names from places where they were first made such as Baleswari from Balesore, Gayeswari from Gaya etc. New patterns sometimes commemorate some notable event e.g. the Elokeshi-bati of Bengal is named after a woman murdered by her husband for misconduct with a monk. The horror of the sin committed by the monk and sympathy for the husband found expression, among other things, in the introduction of various household articles such as fish-knives, saris, utensils, etc. bearing the name of the woman.

Metals are used also as medicines and amulets. In modern medicine iron is used as a tonic while in early culture its strength was "absorbed" by men to make them strong and invincible.

The oldest example of really ancient gold work found on Indian soil is the casket which is in the possession of the India Office Library.

The casket was discovered during the excavation at the site of Taxila in the Punjab. It is of fine gold, studded with Balas rubies. The upper and lower edges are studded with rubies, alternating with raised curly ornamentation. The whole circumference of the casket is divided into eight niches enshrining four figures each repeated twice. Between the niches are figures of birds with outspread wings. The whole is executed in the finest style of repoussé work.

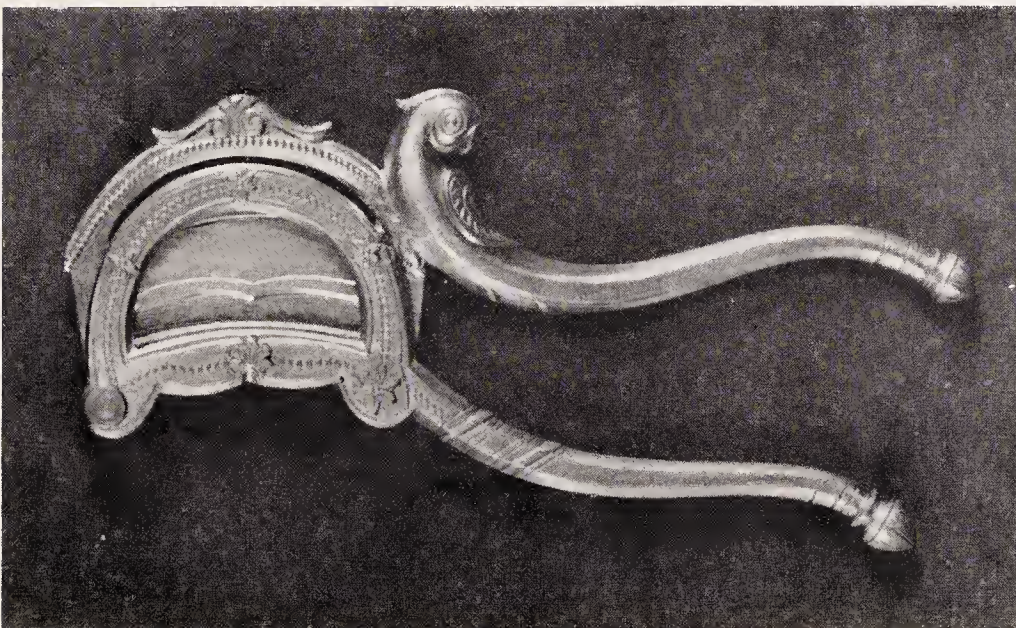
It is strikingly Greek in general character and affords an evidence of Alexander's invasion of India. There seems to be a mixture here of Greek and Indian motifs creating a distinctly Byzantine effect. The most interesting thing seems to be the resemblance of the arches of the casket to the arches found in the piazza of St. Mark in Venice, which was constructed in about 1592. A.D.

The crafts of any country provide plentiful evidence of the influence of other countries. The Indian craftsman has always been extremely adaptable, ready to incorporate any motifs into his work blending it with existing Indian motifs and creating something peculiarly his own.

Of the famous Cuttack filigree work Sir George Birdwood remarks “The silver filigree work in which the people of Cuttack in Orissa have attained such surprising skill and delicacy, is identical with that of Arabia, Malta, Genoa, Norway, Sweden and Denmark and with the filigree work of ancient Greece, Byzantium and Etruria and was probably carried into the West by the Phoenicians and Arabs and into Scandinavia by the Normans, and in the course also of the medieval trade between Turkistan and Russia.”

The Indian goldsmith has sometimes to execute his work on a truly colossal scale especially for specific purposes of purification. Raganatha Rao, the Maratha Peshwa, on his defeat and expulsion from his capital, had a cow made of gold and was passed through it in the hope of bettering his fortune. The rajas of Travancore are said to go through the same ceremony on succeeding to the throne, thereby being elevated to the status of Brahmins.

That the art of metal sculpture was known in India from ancient times is borne out by the discovery of the small bronze statuette of a dancing girl at the



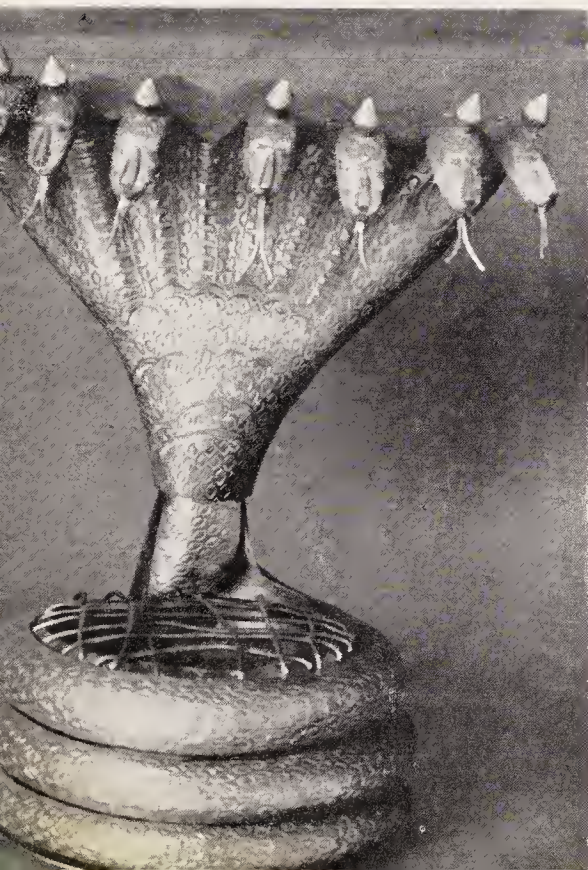
*Betel nut cracker.
(tambul) One handle
is made like a bird
with elongated body.*



*Beautifully made
silver perfume
sprinkler from
Orissa*



△
*Brass bull from Andhra Pradesh.
Eyes, nostrils, hooves etc. are
painted red and black*



△
*Flower bowl of brass—shaped
like a seven-headed cobra*

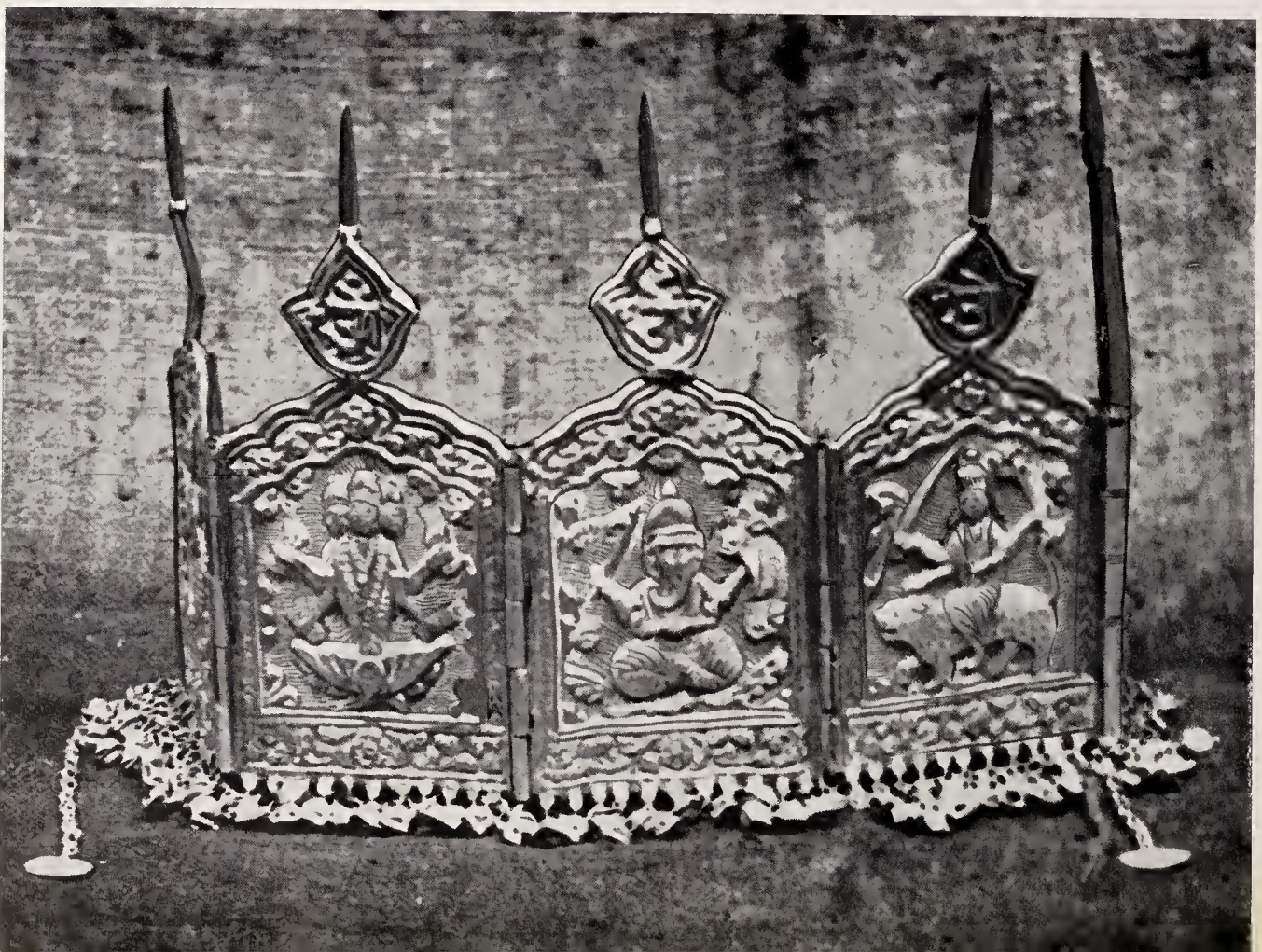
site of Mohenjodaro. Every king encouraged the art of casting statues in metal and Hieun Tsang mentions the fact that he was able to take back with him many statues of Buddha in gold, silver and sandal wood.

Most of the ancient metal figures that have come down to us seem to have been made of pure copper or brass. Bronze was rarely, if ever, used, perhaps due to a scarcity of tin. Many different metals were sometimes mixed to form an alloy considered ideal for casting figures.

The technique of casting was the *cire perdue* or “lost wax” process in which the original model was made in wax which was covered with a coat of clay with openings at the top and bottom. Into the top opening was poured the molten metal, which took the place of the wax which escaped from the lower opening. The completed figure was later chased and embellished with hand tools. This method is still followed for the making of figures in many parts of the country.

The characteristics and poses of the figures, specially of gods and goddesses, were laid down in the ancient treatise on image making. Such things as distance between the neck and the waist, the size of the arms etc., were all fixed in the

*Mukat forming part of a North
Indian bridegroom's head-gear*





*Parvati in brass made in bronze
Production Centre of the
All India Handicrafts Board at Bangalore*



Head of Buddha made of brass

treatise. The craftsman could use his ingenuity only within the limits of these rules. This may have prevented any real originally artistic creations, but it did ensure aesthetic production of the images.

The figures of deities were ideals rather than copies of actual human figures. The Siva Nataraja is meant to depict the joy and sense of victory experienced during a cosmic dance rather than the mere portrayal of a dancing figure. The image of the Buddha rises above mere contemplation and seeks to depict perfect equilibrium and bliss.

Originally, there were no separate castes to work the different metals. Vaisyas and the higher sudras, under the general name of "Karmokara" or artisans, could freely choose any metal to work it as a profession, until it became hereditary and gradually differentiated and stereotyped itself into a separate caste occupation. Thus, jewellers and workers in gold and silver became the Swarmakar caste and braziers and workers in copper became the Kansari caste while the name Karmokar is now exclusively applied to the caste which works iron and steel.

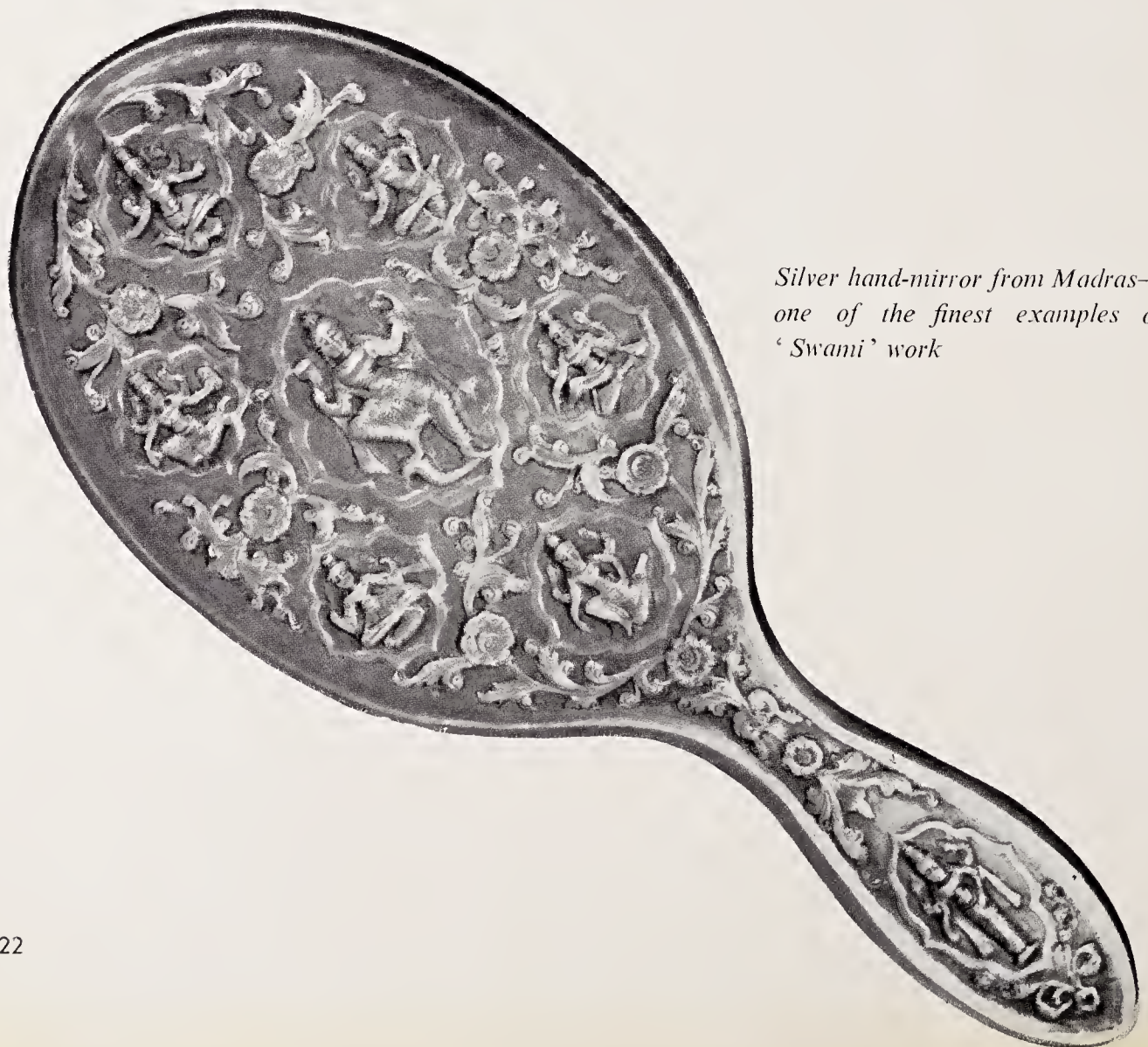
All these castes were held to be highly responsible until the degradation of the gold and silver smiths, which tradition ascribes to their unfortunate propensity to interfere with the weight of the metal entrusted to them for manufacture of ornaments or plate.

gold and silver plate

Gold and silver plate has always been used in India by every one who could afford it. Not only did it eliminate replacement costs and breakage but also the precious metal could always be converted into ready cash and was a standby in times of trouble or disaster.

The princely States of India demanded not only enamelled jewellery but also enamelled utensils such as wine-cups, finger-bowls, pill boxes etc. in both gold and silver, sometimes stone-encrusted. Horse and elephant trappings were also richly repoussed and sometimes jewelled.

Modern trends, however, are towards more modest products and the gold and silver plate produced today is usually plain or, even when ornamented, avoids dirt-catching encrustation and presents a flat surface which can be kept clean with the minimum of effort.



*Silver hand-mirror from Madras—
one of the finest examples of
'Swami' work*



*Idol throne—metal on wood—
from Banaras*

Such goods are produced all over the country, the product of each area displaying certain peculiarities which distinguish it from the products of other regions.

The characteristic feature of the gold and silver plate of Madras State has, until recently, been 'Swami' work, i.e. raised Puranic gods and animal figures on medallions and canopied niches. These figures are either beaten out from the metal surface of the article itself or are separately made and skilfully riveted or soldered onto the article. The best work of this kind is made in Tanjore where it was originally made in copper and silver and brass. The encrusting of copper-ware with brass figures is a modern adaptation of the older art of covering brass with copper figures.

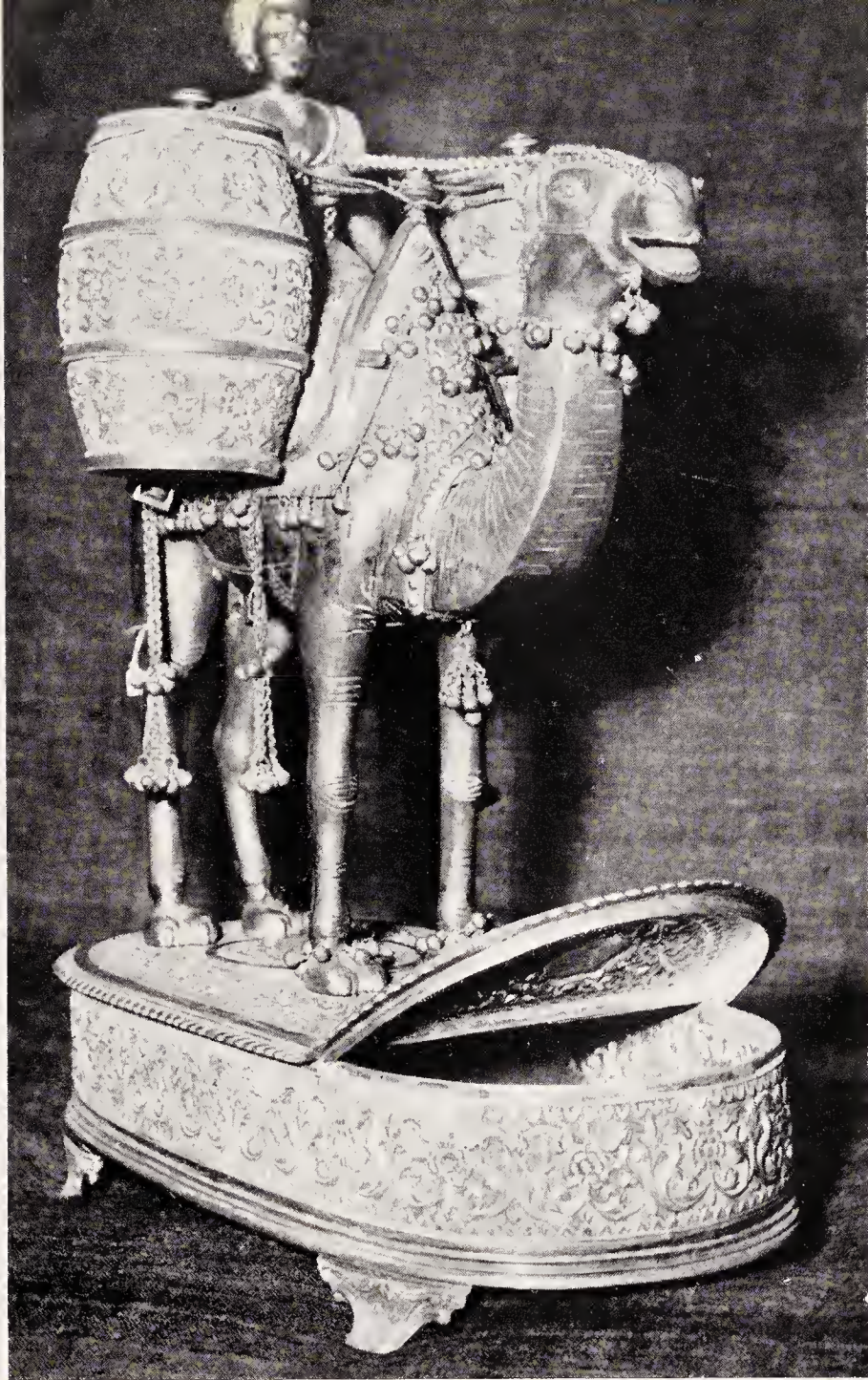
In the engraved brass-work the first rude impressions are made with a die, and by hammering. The work is then completed by cutting away the brass in the space between the figures, and giving it a granulated appearance with a graver. Finishing touches are also given to the figures. Examined closely the figures are seen to be coarsely finished, but the general effect at a little distance is excellent. In the copper and brass ware the vessels are made of brass and covered with figures of copper, which are fixed on the base metal by hammering and a sort of dovetail union. After the copper crusts are put on and worked into shape, the figures are finished by the graver and a chisel. This produces an ornate surface which, though



△
*Silver enamelled tea set, with
gold wash and tray—late
19th century*



▷
*Silver enamelled scent sprin-
kler with gold wash—late
19th century*



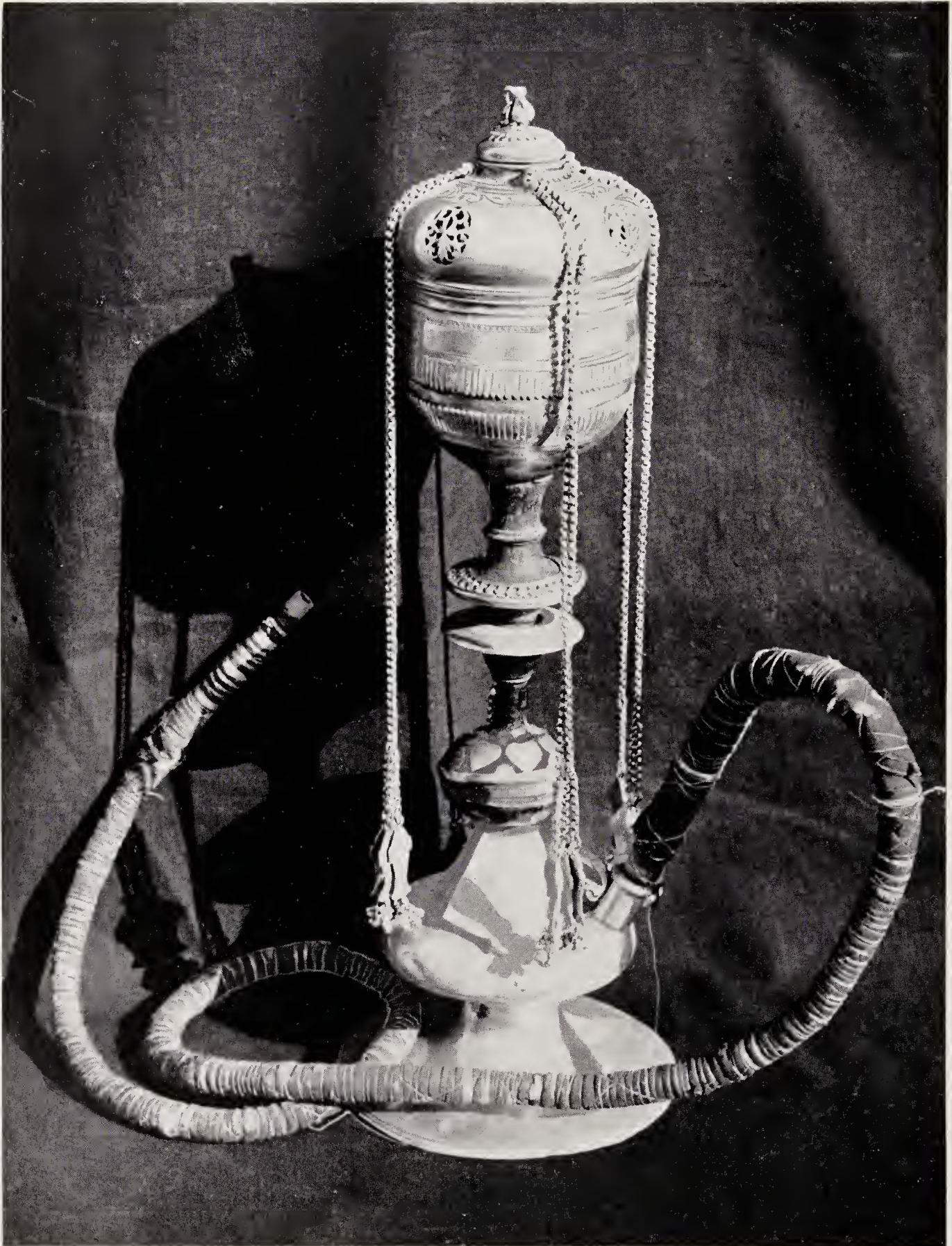
From Rajasthan:

An ingenious silver camel richly repoussed and worked. The barrels on either side of the man contain liquid. By turning the tail to the side the contents of each cask can be emptied through the mouth. The bottom is a box.

aesthetically satisfying, presents difficulties in cleaning. Modern Madras plate, which is produced in a profusion unparalleled over the rest of the country, has a tendency towards extreme simplicity of design and elegance of line and displays a singular lack of ostentation. The only ornamentation is produced with etched lines and alternating bands of polished and frosted silver.

The speciality of Kerala is a variety of both ornamental and utility articles made from small silver coins (chakrams) of the State joined together with fine silver wire or soldered, leaving small spaces and producing a lattice work effect.

The two marked schools of the West are Poona and Kutch. In the former,



*Silver
hookah.*

a very bold and deep form of repoussé prevails. The chief subjects (mostly human or deistic motifs) are in half relief and the silver is usually oxidised. The article is made of carved wood over which silver or copper plate is hammered until the metal takes the shape of the wood carving.

In the latter school a graceful and intricate design in shallow repousse is usual. This shows a distinctly foreign influence and is probably of Dutch origin. The design consists of polished encircling lines or branches on a frosted background, the floral scroll having no beginning or ending. In each, however, a composite flower recurs at repeated intervals. Before the ground is punched in to give a raised pattern the vessel is filled with a mixture of resin and wax. After the major part of the work has been carried out the mixture is removed and the vessel burnished and frosted. The background is punched in with the aid of steel tools with blunt ends to produce the design in repousse.

In the South, chased or repousse decoration is carried out on silver. Before the repousse work is done the article is filled with a composition consisting of gum sandarac, brick dust and oil, heated to melt it. On cooling, this has all the hardness of sealing wax. The surface of the vessel is then smeared with chalk mixed with water and the design carefully drawn on it with a sharp stylus. The ornament is raised above the surface by beating down the ground between the



Silver figure of a woman wearing a sari.



White jade bowl with overlaid design in gold. Miniatures are painted on the jade—Mughal

figures or design with steel tools and a hammer. When the ornament has been roughly embossed, the composition is again heated and poured out, the irregularities and unwanted depressions worked out and the composition once again poured in. The finer details are now added with the use of smaller and finer tools.

In the case of flat articles like trays, etc. the design is embossed in high relief by working from the reverse, the article being placed on a bed of the wax-like composition described above.

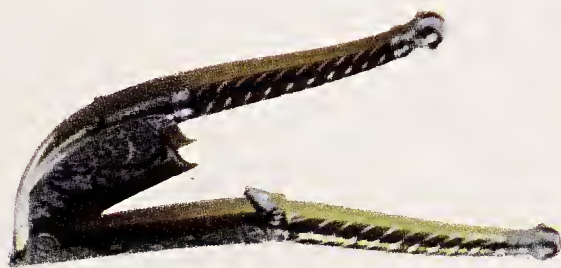
A curiously interesting style of both gold and silver repousse similar to that made in Poona is made in many parts of the country. The article is first made in wood richly carved, then silver or gold plate is held over the surface and hammered until it assumes the pattern carved in the wood. It is then attached to the wood-base with minute nails. This is usually used in making furniture and has the advantage of appearing very expensive without incurring too much expenditure. It is greatly in demand during marriages when it adds considerably to the glamour of the dowry. It is a curious fact that Muslims in this country have always preferred ornamental repoussed articles while Hindus, as a rule, except for objects of religious significance, prefer severely plain utensils and other articles of general use. Even in the application of this art of covering furniture with gold or silver leaf, this rule holds good and while the bed legs and stools of the Hindus are plain those of Muslims are profusely ornamented with floral and animal motifs.

Cuttack has, for many years, been famous for its silver filigree work which has evoked appreciative comments from both Indians and foreigners.



Gold enamelled and diamond studded camel from Jaipur, used for ornamental purposes.

Box from Pratapgarh. Gold cutout design on green glass.



Betelnut crackers (tambul) and knife. Gold on iron. The knife has an ivory handle.

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Sir George Birdwood's remarks on the subject have already been quoted. In India there are certain well-marked centres of the craft of which Cuttack was probably the earliest and is today the most important. It went south and attained considerable importance in Trichinopoly and Karimnagar where a similar form of work is produced but is far superior to that of Cuttack in wearing power and suitability for articles of use. It then moved north into Central India and Rajasthan, achieving considerable importance in Jhansi, where a particularly flat form is met with.

A large part of the work requires nimble fingers and quick eyesight and is done by children of about 8 to 10 years of age, the sons and pupils of the silversmith. Only the purest silver can be employed for this work although it is alloyed with a small quantity of lead before being used. It is drawn into flat wire and subsequently twisted on itself to give it the appearance of minute rope or string. The wire is then cut into required lengths from which are formed leaves and flowers, the interiors being packed as full as they will hold of rolled-up wire. The master silversmith then sprinkles this with soldering salt, places it on a piece of mica and holds it in the furnace until the packing of wire becomes soldered together and to the frame. The skill lies in not causing the solder to fuse over more than the desired points of attachment. The process of whitening and cleaning the silver is more or less a trade secret. The art of filigree is probably the oldest in the world when the primitive workman found that it was easy to make beautiful designs just by making spirals of fine wire held together by solder. The ornateness of filigree articles is not in keeping with the modern trend towards simplicity and the demand for such articles has gone down recently. However, Cuttack, Trichinopoly, and Karimnagar still produce luxury articles such as scent sprinklers, trays, plates, card cases, etc.

Kashmir excels in the production of silver plate as it does in so many crafts. Articles are produced in a vast variety of designs, the prices ranging according to the intricacy or boldness of the design and the time required to finish an article. Articles are made here in either a shallow repousse with pierced design or on a flat surface with lines, the emphasis being given by narrow bands of polished silver separating and highlighting the pattern. The common designs are the shawl pattern, the Arabesque, the rosette, Chinar tree pattern and the Tibetan style of work in which the spouts and handles take the form of dragons. All kinds of utility articles such as tea sets, coffee sets, trays, cigarette boxes, soap dishes, jugs and ewers are made in Kashmir.

Portions of a silver article are sometimes covered with gold water. The design thus formed is known as the Ganga-Jamuna pattern from the rivers

Ganga and Jamuna which meet at Allahabad and flow together to the sea but maintain the distinct colour of their waters for some distance. That of the Ganga is described in the books as white while that of the Jamuna is deep blue. Therefore, when on the same article patterns of two colours meet or run side by side, the vessel is said to be of the Ganga-Jamuna pattern.

The articles made at Amritsar are made largely by Kashmiri workmen settled there and are generally of Kashmir patterns.

Lucknow, which was the seat of the Nawabs of Oudh, produces an extensive range of gold and silver plate in a multitude of patterns. The designs are very close to those found in Kashmir. Owing to the strong Muslim influence prevailing here most of the articles are highly ornamented, in a sort of shallow repousse depicting hunting and jungle scenes and floral motifs.

Rajasthan, with its many Courts, afforded patronage to the manufacturers of gold and silver plate and the work is of a very high order. Processions worked in repousse with figures of men, elephants, carriages and other accessories are usually a favourite motif.

The gold images of Durga, Lakshmi, Krishna, Radha and Saraswati kept in private houses and worshipped daily are manufactured in many parts of the country. The weight of these is fixed by regulation. These images should weigh at least one tola and usually weigh 3 or 4 tolas. The images of Shitala (the chicken pox goddess) are always of silver and weigh 10 or 12 tolas.

With the use of modern designs and articles a knowledge of the requisite amount of alloy to produce a certain hardness becomes essential. The sterling formulae which are well guarded secrets in the West have not yet been satisfactorily discovered in India. Large firms have experimented with the quantity of alloy and set their own seal on articles in order to guarantee the quantity of silver in each.

Traditionally, the purity of the precious metal has been much valued in India and it was a matter of pride for the owner of an article to be able to judge its purity by testing its extreme pliability. Even though a certain amount of hardness has been introduced in the manufacture of tea sets etc. the making of cutlery remains a problem. Indian craftsmen produce forks and spoons which either bend every time they are used or have a far greater quantity of alloy than is permissible under the sterling system. However, with increasing demand for articles of Western design, experiments continue and it is hoped that in the near future standardised articles will be produced on a large scale.

brass and copper ware

The manufacture of household utensils in gold and silver is restricted to a few centres since the demand is comparatively limited but that in brass and copper forms an extensive industry all over the country. Each of the States has two or three centres noted for their copper and brass ware and, accordingly, a corresponding number of widely different art conceptions are practised in the ornamentation of these metals.

Copper is called 'tamba' in Hindustani, Zinc 'jasta' and tin pewter is 'ranga'. Two or more of these metals are utilised in the manufacture of the alloys used in India. Brass is made from copper and zinc in varying proportions, usually two of the former to one or one and a half of the latter. Bharat, Kaskut or Kansa are the most constant of alloys of India and correspond to the bell metal of Europe or white brass. On account of its bright colour and the polish that it takes this metal is in great demand for ornamental purposes. It usually consists of 7 parts of copper to 2 parts of tin.

The smelting of copper has almost ceased in this country. The sheet metal is now solely employed for the manufacture of copper vessels while old copper collected in the country is melted down into brass and bronze but is not used directly in the manufacture of copper vessels. These vessels are never made by casting into moulds, for the manufacturers do not know how to melt this metal, without the addition of zinc, tin or lead.

Country brass is used for making both hammered and cast vessels. Generally, country brass is an alloy consisting of 2 lbs. of copper and $1\frac{1}{2}$ lb. of zinc, but that with $1\frac{1}{4}$ lb. of zinc to the same quantity of copper is considered a better quality while a proportion of 2 parts of copper to 1 part of zinc is considered even better. A very small quantity of lead is often added to brass in order to make it soft and malleable.



Copper water container with etched and hammered design



Lush tropical colours of the jungle for this gold enamelled parrot from Jaipur—



*Toilet box from Rajasthan—
Silver covered with gold leaf
and enamelled*



Samovar from Kashmir used mostly by Muslims. Note the Arabesque style of ornamentation. Made of copper and tinned.

Bronze is not imported, but is made in the country. It is an alloy consisting of 7 parts of copper and 2 parts of tin. Pure bronze, as a rule, is only employed in the manufacture of plates and other articles that require to be made by hammering. For cast articles an impure alloy called Bharan or Toul is chiefly used. There is no fixed proportion of the metals employed to produce Bharan, but the greater the quantity of zinc in the alloy, the less superior the quality. The Bharan is brass with a little mixture of tin to give it a whitish appearance. A small quantity of lead is added to Bharan to make it soft and easily worked.

The various alloys prepared are :—

- (1) Kansa — lead and brass mixed.
- (2) Bharat — brass and copper mixed.
- (3) Phulkansa — pewter, copper and silver mixed.

Utensils are either hammered into shape from sheet-brass or sheet-copper, or from country brass or are cast into moulds or partly cast and partly beaten. Sheet brass (except scraps) and sheet copper is never melted and cast into articles but is beaten into shape and, if made of several pieces, joined together. For any article, consisting of one or more pieces of metal the copper or brass sheet is first marked out by a pair of compasses and the piece or pieces cut off by a kind of scissors called Katari. It is then made into the required shape by alternate heating and hammering, and is finally turned on the lathe. Each piece is first reduced to its proper shape by continuous hammering and is afterwards joined together by borax and solder which is a kind of hard brass, being an alloy of copper and zinc.

The final polish is given on the lathe. Buyers prefer hammered to cast articles as the former can only be made of superior quality brass and bronze.

Ordinary domestic utensils are rarely ornamented since they are scrubbed daily with mud or ashes. But the shapes of these vessels are extremely graceful and the finish and style of some localities is far superior to that of others.

Some of the most beautiful and interesting copper and brass wares of India are those directly required for ceremonial purposes or which have been derived from the implements used in temples. The kusi or achmani used by priests in sprinkling holy water and making drink offerings are beautiful symbolic objects largely drawn upon in decorative art. The dhup-dani or censor is often extremely beautiful while the sinhasan or idol throne of lotus-leaf pattern has originated much that is admirable in India. The lamp (arti), especially the hanging lamps, and the bells (ghanta) found in every Indian temple have considerably stimulated art conception and some of the most beautiful examples of Indian art are found in these, especially in the chain used to hang up the bell.

Kashmir produces two well-marked forms of copper and brass, one from the valley and the other from Lhasa. The former bears the stamp of Persian influence while the latter is markedly Tibetan and Central Asian in character.



Brass ewer with bold enamel design from Jaipur



*Elephant lamp shaded
by the hooded serpent*



*Nepali lion now made in
large quantities in India*

Tin is soldered on copper which has been previously graven over with a diffused floral design. The sunken ground is then filled in with a black composition. The articles are studded over with little raised flowers, which shine like frosted silver out of a ground work of blackened foliated scrolls, which are traced so delicately as to look like the finest Chantilly lace.

The pattern is traced with a steel style, and is then cut with great rapidity with a hammer and small chisels or punches. When the engraving is complete the object is heated and the ground is filled in with heated lac after which it is rubbed with deodar charcoal, which polishes the plain surface and removes the superfluous lac. The whole is again heated and rubbed till the lac has lost its shine, and a dead black deposit is left in the incised parts. The whole is then tinned in the usual way, the lac acting as a reserve and stopping out the tin.

Moradabad, in Uttar Pradesh, is also famous for utensils, both utility and ornamental, of white metal and electroplated, brass and copper, plain and ornamented which are in great demand all over the north. The engraving is either sada (plain) or sia kalam. In the former style, a floral design is generally incised or engraved on the brass article which has been previously tinned so that the "gold" of the brass shines through the incised lines of the design against the white lustre of the tinned background. Sometimes the process is carried a

little further and the areas inside the engraved lines of the pattern are further embellished with frosted decorations or small perforations. The engraving may or may not be filled with coloured lac.

In the sia kalam style, the actual ornamentation is embossed in low relief or the ground graved out to bring the floral design into low relief, sometimes against a minutely chased background. The depressions in the ground are then filled with coloured lac leaving the floral scrolls of the design in the golden yellow of the brass. At present, in inferior work, white, red and green synthetic lacquers are used instead of the lac.

Modern streamlined articles of Swedish design in polished brass or burnished copper are also made here satisfying the demand for modern accessories to sophisticated interior decoration.

Banaras is the first city in India for the multitude of its cast and sculptured mythological images and emblemata in brass and copper as well as household utensils. Brass is largely used in the manufacture of these mixed with 6 other



Brass tray engraved with hunting scene. Can also be used as table top.



*Badla (Water Cooler)
from Jodhpur. Very
convenient for travellers
during the hot weather.*

*Brass jug—
contemporary design*



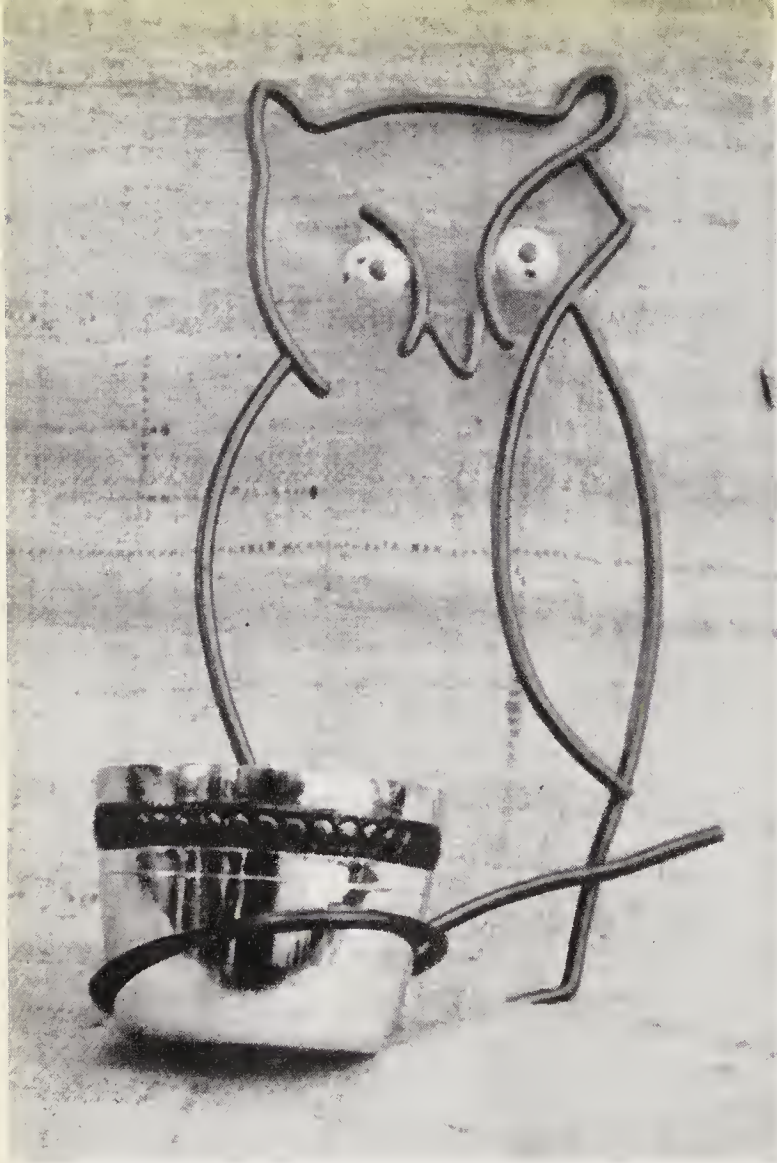


*Water pot (can also be used as flower vase)
from Jaipur—
enameled on brass*

*Colourful brass
enameled pandan from
Rajasthan*

*Enamelled plate on
brass from Moradabad
with a portrait of the
Emperor Humayun.
Note the detail of the
Emperor's costume*





Ornamental ash tray



Perforated brass lamp

metals, gold, silver, iron, tin, lead and mercury making with the zinc and copper of brass, a mixture of 8 metals, which is deemed a perfect alloy, and is highly prized.

The larger idols are always cast in moulds, and afterwards finished. These are usually of Siva, of Siva riding on Nandi, Lakshmi, Durga and sometimes of the serpent Naga and are kept in many houses and worshipped daily.

Mirzapore is now one of the most important centres of the brass utensil industry in Uttar Pradesh. It supplies the needs of a large part of the State and even exports articles of household use to other States.

Lucknow has specialised in articles of use showing distinct Muslim influence, usually profusely ornamented in a shallow repousse using animal and flower motifs and pierced designs.

Brass and copper utensils form the staple of the metal works in the Punjab and in all large cities great quantities of cooking utensils, lamps etc. are made for local consumption. Amritsar, Ambala, Ludhiana and Jullundur, all export brass vessels to the hilly regions round the Punjab and formerly also exported up the Kabul Valley into Afghanistan.

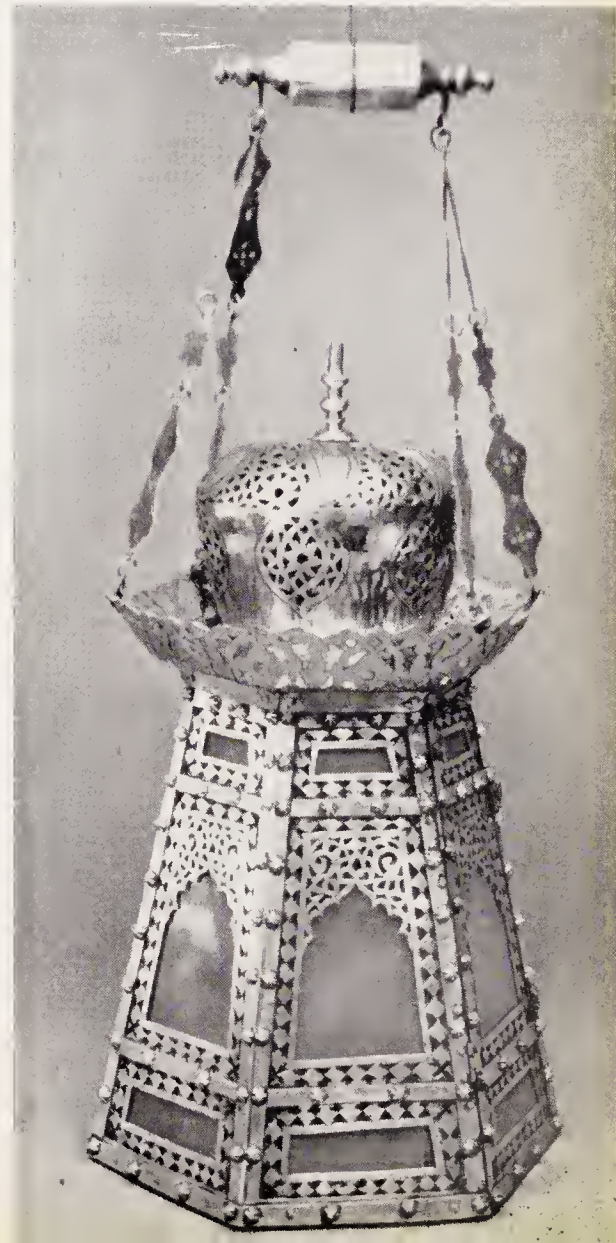
Bihar and Bengal produce an extensive range of domestic vessels in brass and bell metal especially in the regions of Malda, Patna and Gaya.

Nasik, Poona and Ahmedabad have always been famous for their copper and brass work. In the first two places a large sheet of brass or copper is placed on the floor. On it is traced the shape of the article to be made which is then cut out with scissors or a chisel. The metal is then softened in the fire and hammered first on a hollow stone anvil, and, as it assumes a hemispherical shape, it is hammered three or

*Left :
Copper
vase with
engraved
design*



*Right :
Brass
hanging
lamp in
Moorish
design*



four times till it is beaten into shape. Each vessel is generally made of two pieces, a lower and an upper, separately beaten into shape and soldered with brass, borax and chloride of ammonium. The polishing given to cooking utensils is a rough scrubbing, with a mixture of powdered charcoal and tamarind pulp, followed by a further beating with a small hammer till the whole surface is covered with small facets. Besides the ordinary household articles the braziers of Ahmedabad make graceful and delicately cut brass screens, pandans for holding betel leaf, and small boxes covered with the most graceful tracery. They make their own brass in the proportion of 4 parts of copper to three of zinc.

A good deal of iron work is also done at Ahmedabad. Bells for bullocks are a speciality of Siraang in the Belgaum district. The School of Art at Bombay has, for years, pioneered a high development in repousse ware. Baroda specialises in producing plates of repousse brass hammered on carved wood work.

Many articles imitate enamelled wares. Here the colour is provided by black or coloured lac. The process is explained elsewhere. The coloured ornamentations show on a gold, silver or tinned background.

In many places the copper is simply incised through the tinned surface thus showing the pattern in bright colour.

Muslims all over India use cooking and eating utensils of copper. These have to be tinned before they can be used with safety. The ornamentation of tinned wares falls into distinct categories of style and pattern.

Kashmir produces certain design such as (1) the floral rosette on a black background, consisting of small rosettes assorted on a spirally twisted line which passes all round the object and forms an intricate pattern in bunches of rosettes. (2) The Arabeque style, which consists of elongated flamboyant figures that convey an impression of being composed of Arabic inscriptions arranged geometrically, but are really a complex design of bifurcated and minutely interlaced floral scrolls.

The brass and copper wares of India have caught the imagination of the world and are very attractive for tourists. Indian workmen have absorbed the ideas of the West and produce, for both home and foreign consumption, elegant articles of burnished and oxidised copper and gleaming brass.



*Covered box from Tanjore; Silver
and brass encrustation on copper*

The All India Handicrafts Board, through its emporia and private manufacturers, is encouraging the manufacture of articles which, while retaining their distinctive Indian characteristic forms, provide the proper accent to modern Western and Indian interior decoration. Classical Indian designs vie for popularity with streamlined Swedish design pitchers and fruit dishes. Brass candlesticks find a ready market along with lovely light holders of Moorish design and wall plaques of copper encrusted with brass showing traditional Indian dances or elephant processions. The brass calendar with etched figures and adjustable names of days sometimes showing the phases of the moon continues to attract admirers. Lovely brass table tops enriched with the most beautiful tracery supported on wooden legs graces many a modern drawing room while shining brass coal scuttles and magazine racks are found in many European and American houses.

The tourist trade and Government patronage have given a terrific fillip to the metalware industry which, today, is as flourishing as it has ever been in the history of the country and is one of the great earners of the much needed foreign exchange.

The tools used in the manufacture of these articles are simple and few in number. The usual ones are the hammer and anvil, chisel, tongs, file, lathe, the scraper used for the lathe and called Noyali in Bengali, a small piece of triangular iron to scrape the clay mould, knife, scissors called Katari and wooden hammers.

damascened and encrusted ware

Both these terms denote the surface ornamentation of one metal through the application of one or more metals. Damascening is the art of encrusting one metal on another in the form of wire which by undercutting and hammering is thoroughly incorporated into the metal it is intended to ornament. Practically, damascening is limited to encrusting gold and sometimes silver wire, on the surface of iron, steel or bronze. The design is chased on the steel (or iron or bronze) surface with a hard and very sharp style, and the wire, held by one hand within the grooves, is hammered by the other, until it is made literally to unite with the metal. This form of ornamentation is purely oriental and takes its name from Damascus, where it reached perfection under the early goldsmiths.

The chief centres of damascened work in India are Jaipur, Alwar, Sialkot, Travancore, Kashmir and Bidar. Jaipur and Alwar renowned for their skilled artisans, still produce damascened swords, daggers, elephant goads and even shields to a very limited extent and mostly for ceremonial purposes. Muslim craftsmen show an admirable skill and pride in the laying of wire to form verses from the Koran, verses of poetry and prayers to bring good fortune. In Travancore, the damascened designs are chiefly floral and suggestive of Dravidian influence, the work consisting of fine gold wire beaten into a background of steel on which the pattern is first engraved and undercut.

B. H. Baden Powell has thus described the artcraft of damascening as obtaining in this country:

“Koftgari is done by first drawing out the pattern on the steel surface with a hard steel needle or silai. This leaves a line sufficiently deep to catch the very fine wire laid on. The wire is of pure gold, drawn through a steel jandri. The wire is then hammered into the iron according to the pattern and lines already drawn, the whole is then heated and again hammered, and the surface is polished with a white porous stone; where the soft gold is required to be spread, the rubbing and hammering are repeated with greater force. The gold used is pure and very soft.”



Pieces of turquoise embedded on metal form a lovely mosaic in these articles from Kashmir

The styles of damascening differ in different parts of the country and this is especially to be noticed in old arms.

The Koftgari or Teh-Nishan: The steel is engraved very deeply and thick silver or gold wires hammered into the chasing while the metal is still hot. This is next filed down, cleaned and blued until it presents a smooth polished surface. The surface is blued by the action of heat only and no chemicals are used.

Ganga-Jamuna : This is like the above but gold and silver wires are used in the same design the gold often alloyed with a little copper to give it a pinkish tinge.

Shallow Koftgari : The chasing is shallow having been made with files and the wire is embedded in this shallow chasing. As only very thin gold or silver wires can be laid in the extremely shallow grooves, the surface cannot be polished to any great extent.

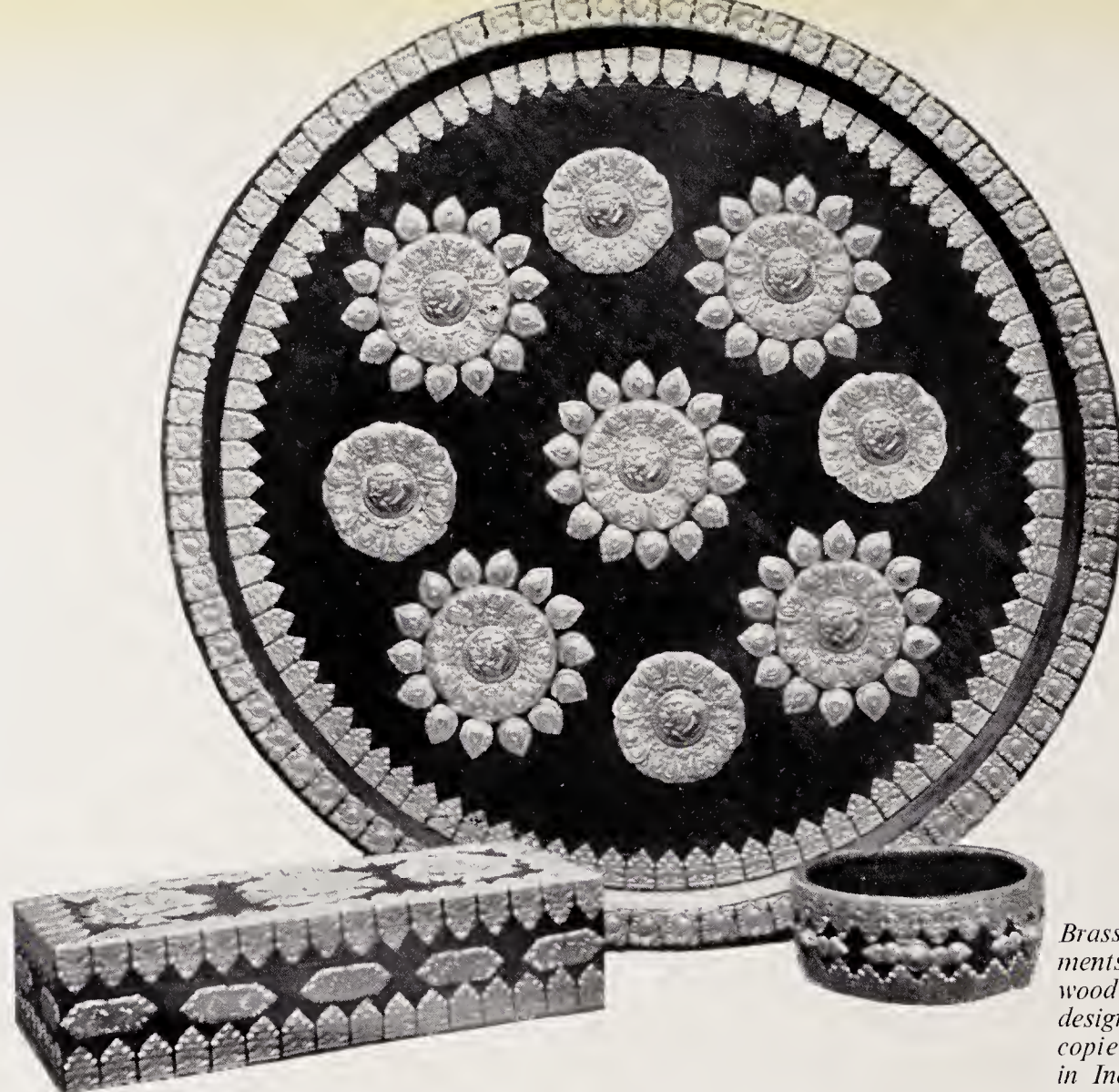
Of encrusted wares there may be said to be two forms, the one with applied metal raised above the surface of the base metal the other with it below the surface.

The flat form (represented by bidri ware) has the design completely excavated and the metal placed within and secured by hammering. There are two forms of this work—one in which the exact form and ornamentation of the applied metal is practically finished before being attached and the other, and usually, the more beautiful, in which the design is only cut out of the ground metal, the applied metal being fixed and at the same time, hammered and chased into form. In this form the applied metal is mainly above the surface. When both gold and silver are used (Ganga-Jamuna), the gold is mixed with copper in order to obtain a pinkish tint. In the cheaper variety of the work the amount of gold and silver employed is very small. The design is engraved in shallow grooves and a very fine wire is hammered into this. The surface cannot be polished and smoothed and consequently, the wire can be readily felt on the surface.

The cheapest form is the imitation koftgari which is called Dewali. The surface is smoothed with a file and, afterwards, with pumice stone. The pattern is then scratched with a stylus and lime juice is sprinkled over it to thoroughly cleanse the surface. It is then heated and gold leaf (lifted with a pair of pincers) is applied and lightly hammered, then rubbed with the 'mori' stone which causes the gold to adhere to the portions of the surface scratched for its reception. This form is found in the Punjab and Rajasthan.



*Oxidised
copper vase
with copper
ornamentation.
Modern*



Brass ornaments fixed on wood. Tibetan design now copied freely in India

Bidri ware takes its name from the city of Bidar situated about 75 miles north-west of Hyderabad. This work is of black colour which never fades and is relieved with silver and, sometimes, gold inlay. The composition of the alloy differs slightly from region to region. In Lucknow the chief metal is zinc, lead, tin and copper being added each in the proportion of 1/16 of the zinc. In Bidar itself, the proportion of zinc is greatly decreased and that of lead increased. In certain areas lead is entirely omitted.

The desired vessel is first moulded and then reduced to the exact shape on the turning lathe. It is next engraved or chased in varying depths according to the quality or kind of work that is required to be produced. It is, therefore, smoothed, polished and coloured to a dark green or black colour by ammonia and saltpetre moistened in rapeseed oil and thickened with charcoal. In Lucknow blue vitriol is added. The vessel is slightly heated by placing it in the sun, then rubbed with the colouring preparation and allowed to cool for several hours. It is thereafter washed and rubbed with a little oil, when the colour becomes permanent.

There are two forms of bidri according to the depth of embedding and the quality of the metal affixed to the surface. They are known as Teh Nashan or deeply cut work and Zar Nashan (or Zar Buland) or raised work. In the former, the pattern is deeply excavated and the silver or gold cut to the exact shape and size of the chased pattern. After being embedded, the surface is smoothed and polished, the silver or gold ornamentation being then within or below the surface.

The degree of hammering applied to Koftgari causes the gold or silver to spread over the rest of the work. In Rajputana, dewali work is subsequently scratched to remove portions of the gold and produce a closer similarity to wire inlaying.

The chief centres of bidri work are Hyderabad, Lucknow, Purnea and to a small extent, Kashmir.

One of the oldest and at the same time, most beautiful patterns used in Hyderabad is the poppy plant, a design which occurs all over India. Perhaps after the poppy pattern, the most prevalent is that in which wire alone is used in the elaboration of a minute ornamentation in silver crosses or stars, assorted in a diagonal fashion.

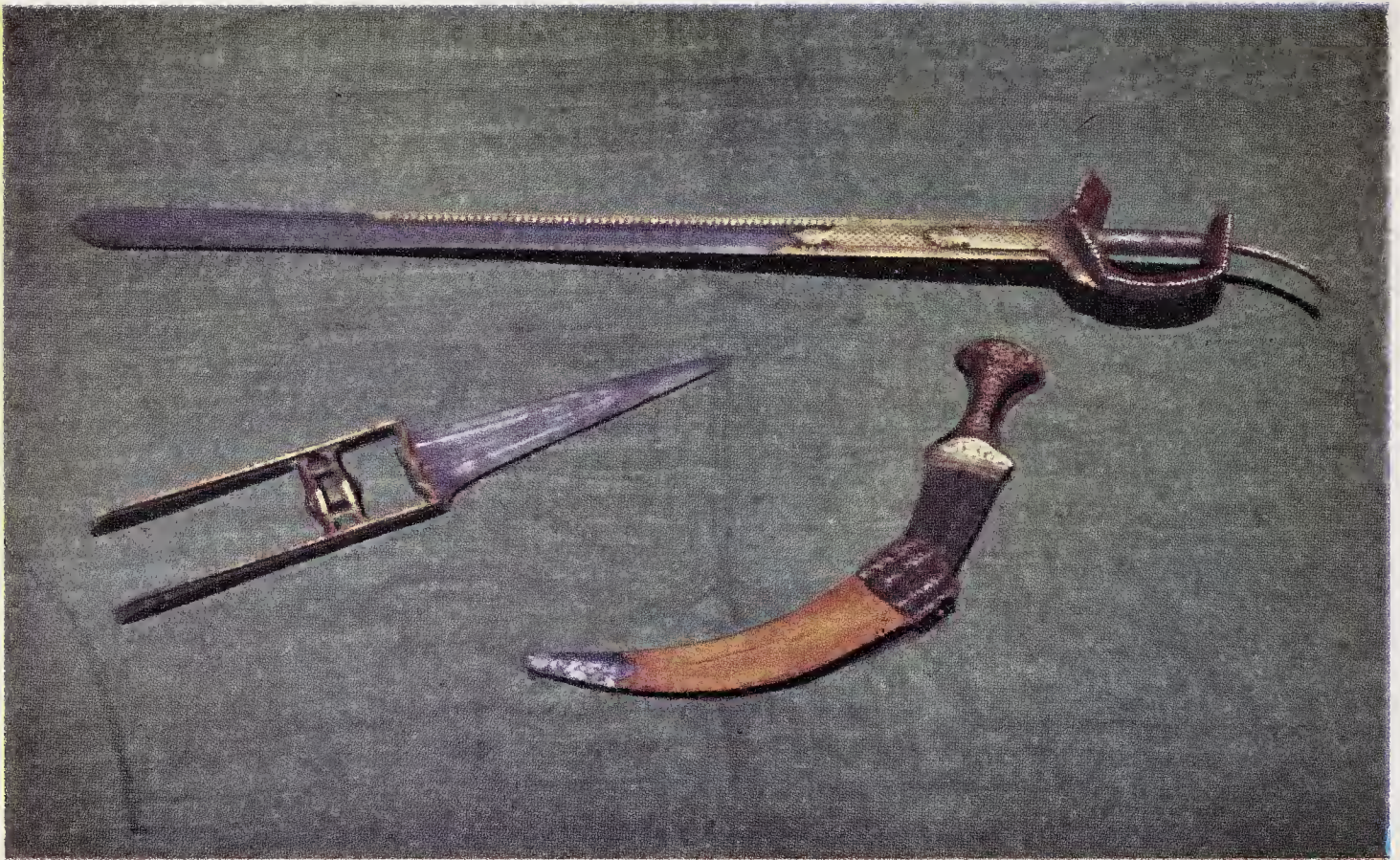


Oxidised copper pot with encrusted design in Silver.

In Purnea the wire alone is not used but the silver or gold in fairly large patches is cut in the form of flowers or animals and deeply embedded and polished. Purnea work shows a distinct Chinese influence which probably penetrated there through Sikkim and Bhutan.

Kashmir ware has designs worked in wire embedded below the surface but much less wire seems to be employed than in any other form of bidri and the design is almost invariably a diaper.

In Lucknow the art of manufacturing bidri seems to have been introduced by the Nawabs of Oudh. These Nawabs held their power through the emperor at Delhi who bestowed on them the dignity of the fish (Mahi Murattib). They prided themselves on possessing this title and were proceeded on ceremonial occasions by a fish emblem. Lucknow



*Sword and daggers from Rajasthan.
Handles and edge of sword blade
have gold inlay on iron*



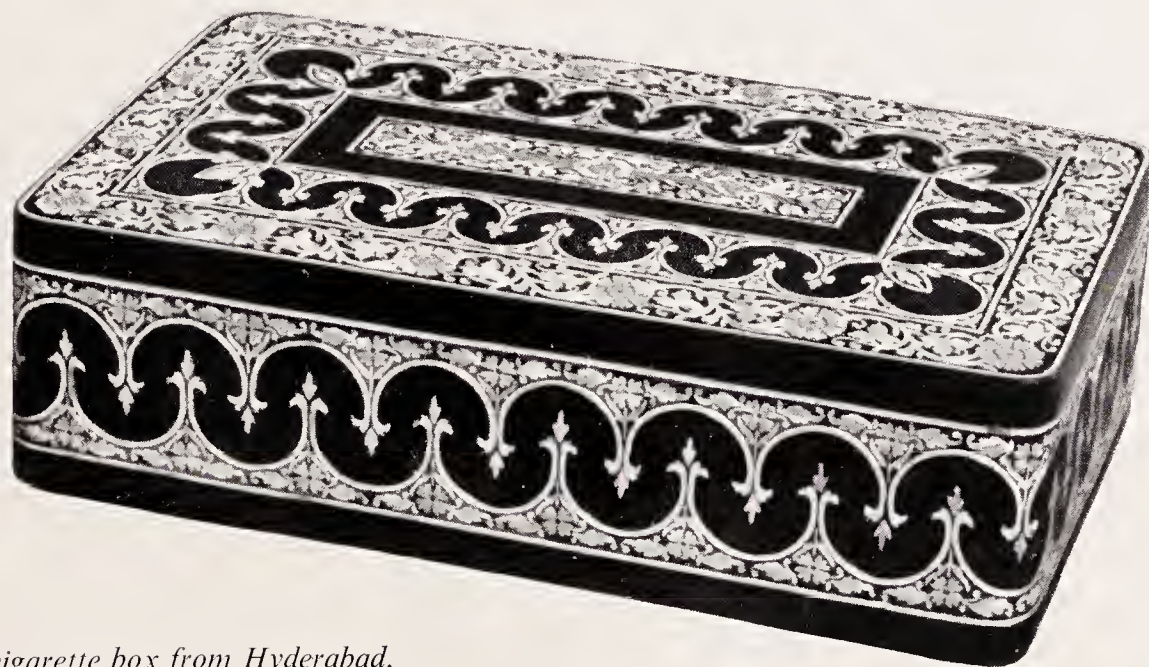
*Modern brass enamelled carving
set from Moradabad*

bidri, therefore, abounds in fish motifs along with the flora and fauna found elsewhere in the country. The vine leaf pattern is another favourite of the city.

Bidri ware will not rust and even if it does it can be easily restored. It is very heavy and will break only if dealt a severe blow. It presents a very rich appearance and is much in demand. The art seems to have originated with the ornamentation of swords and other weapons. Later, the skill of the worker was diverted towards the ornamentation of articles of domestic use e.g., ash-trays, sherwani buttons, cigarette boxes, spittoons, bed legs etc. No Muslim family of Hyderabad considers the dowry of a daughter complete without the inclusion of as many articles of bidri ware as the purse allows and articles are acquired piece by piece from the time a girl is born upto the time of her marriage.

South Indian encrusted ware is very famous, the most outstanding work being done in Tanjore. In the characteristic 'Swami' ware of Madras State the ornamentation consists of figures of Pranic gods in high relief, either beaten out from the surface or affixed to it, whether by soldering or wedging or screwing them on. A piece of silver or brass is taken and repoussed on a bed of lac. When finished this is held over the surface of the metal upon which it is to be attached, then chased until the groove produced is able to receive the edge of the applied piece. Finally the rim of the ground metal is hammered over it.

Another variation of this is the Zar Nashan or Zar Buland work. In this the outline of the pattern is engraved and the silver leaf held over it and rubbed with the



Modern Bidri cigarette box from Hyderabad.



Plate from Tanjore of copper with silver and brass encrusted design.

finger until a tracing of the design is imparted. The leaf is then cut into desired pieces, each a little larger than the space it is desired to cover. The margin or rim of each is bent over and the cavity thus formed is filled with a piece of soft leaf. This is next inverted over the space and the margin of the structure pressed into the engraved outline. Lastly, it is hammered or punched all round so as to cause the surface metal to embrace firmly the applied piece. The process is then finished by the silver leaf being punched or chased on the surface in completion of the desired pattern. In Trichinopoly, brass vessels are encrusted on the surface with zinc.

Although in no way comparable or connected with bidri ware, the art of mosaic of Kashmir may also be mentioned here. This is done by compacting the recesses of a pattern in brass with fragments of false turquoise embedded in cement.

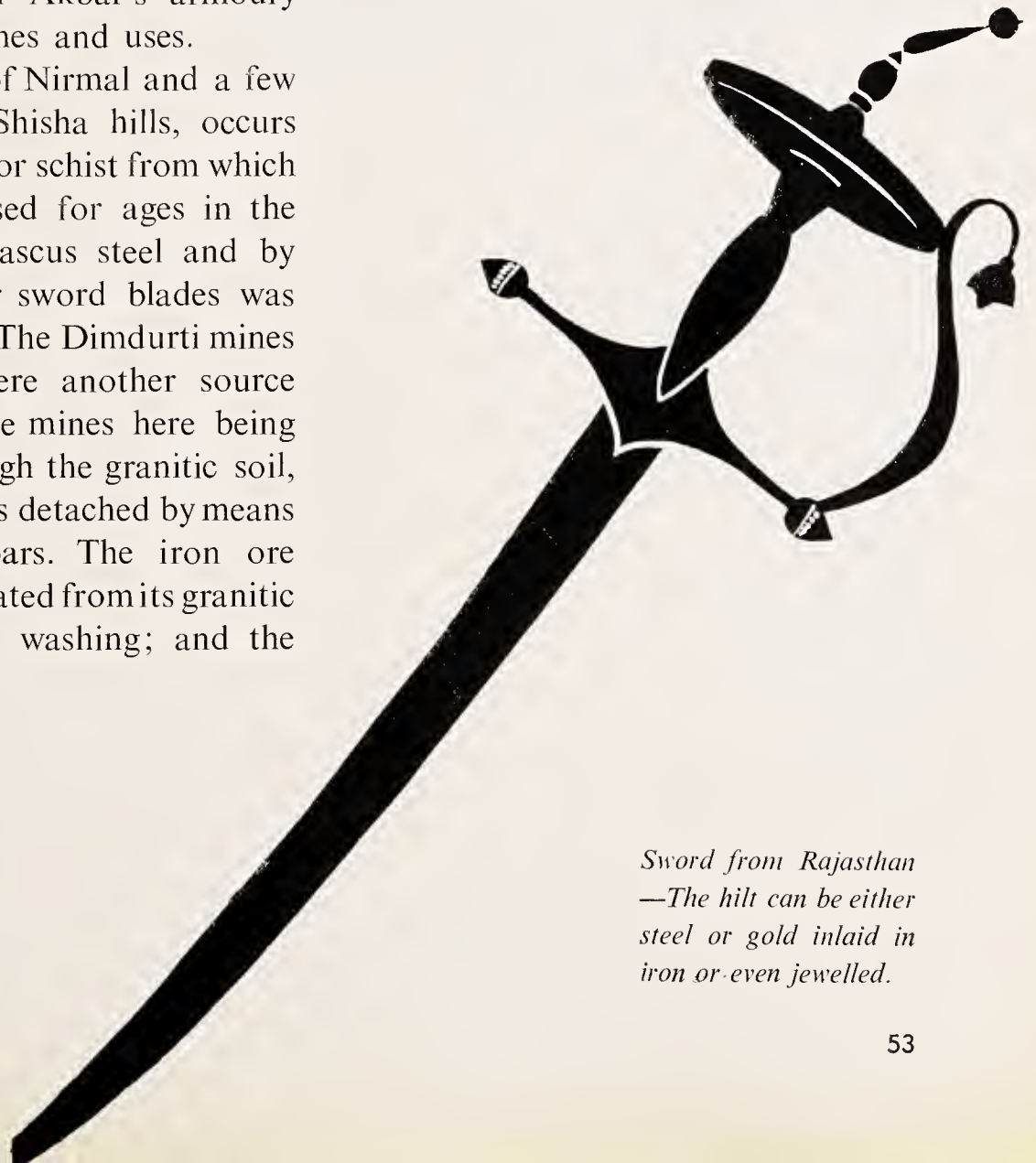


Metal ornament and knocker for door—from Jaipur.

arms and armour

In the Rig Veda frequent reference is made to the use of the bow, the mastery of which was considered so important that a supplementary Veda, the Dhanur Veda is devoted to the science of archery. The Agni Purana gives a most elaborate classification of arms and these are represented in great variety on ancient monuments of India. Vishwakarma, the Vulcan of the Hindus, forged mighty weapons for the gods. That chain mail coats were used in the country is seen from the coin struck by the Indo Scythian Kings of Northern India. Indian steel has been celebrated from earliest times and the blades of Damascus, which maintained their pre-eminence even after the blades of Toledo became famous, were in fact made of Indian steel. In Persian, the term 'faulad-e-Hind' (Indian steel) has become anonymous with invincible strength. The Ain-i-Akbar gives a detailed description of the arms kept in Akbar's armoury along with their names and uses.

Twenty miles east of Nirmal and a few miles south of the Shisha hills, occurs the hornblende slate or schist from which the magnetic iron used for ages in the manufacture of Damascus steel and by the Persians for their sword blades was and still is obtained. The Dimdurti mines on the Godavari were another source of Damascus steel, the mines here being mere holes dug through the granitic soil, from which the ore was detached by means of small iron crowbars. The iron ore was still further separated from its granitic or quartz matrix by washing; and the



*Sword from Rajasthan
—The hilt can be either
steel or gold inlaid in
iron or even jewelled.*



Beautifully engraved & embossed shield from Rajasthan.

ore-rich sand thus obtained was manufactured into Damascus steel at Kona Samundram near Dimdurti. The sand was melted with charcoal, without any flux, and was obtained at once in a perfectly tough and malleable state, superior to any English iron or even Swedish.

With the use of modern arms and decline of the princely states which, until recent times, patronised traditional weapons mostly for ceremonial purposes, the armourer's craft has declined but even now the making of spears and knives continues to be a flourishing trade although these are now more utilitarian than decorative while the making of arms for aborigines still provides occupation to many a craftsman.

Excellent steel for gun-barrels and swords was made along the banks of the Narbada, in Madhya Pradesh; in Berar, in Mysore, Punjab and Rajasthan. The quality of the knives and spears made by the Ghasias along the Upper Godavari is of undeniable excellence. In Madras State arms and cutlery of a high quality are produced, while the superbly mounted arms of Vijayanagaram in Andhra are used chiefly in pageantry.

Indians valued arms not only for their protective and destructive value but also for their ornamentation. Kutch silversmiths were famous all over the country for

*Shield from Rajasthan,
elaborately engraved &
ornamented with lacquer.*



their decoration of arms of all sorts in repousse gold and silver. The armourer's craft was mostly in evidence in costly damascened, sculptured and jewelled swords and shields, spears, daggers and matchlocks.

A remarkable suit of armour in the Prince of Wales collection was one made entirely of the horny scales of the Indian armadillo or pangolin (*mania pentadactyla*), encrusted with gold, turquoise and garnets. Another is a suit of chain armour made in Kashmir worked as finely as lace work. Sword blades are marvellously watered, several being sculptured in high relief with hunting scenes and others have tooth-line saws. The kukris of the Gurkhas which are made in Dehra Dun have won world-wide fame and bear testimony to the excellence of the armourer's craft. The engraving of iron and steel was an important industry in India and Indian arms displayed a marvellous skill in the art of steel carving. Throughout India art dealers offer for sale swords, daggers, shields in high quality carved steel.

Indian arms are characterised by the high relief of their elaborately hammered and cut gold work, and the unsparing use of precious stones gave them a splendour that roused the envy of the world.



All the colours of the rainbow are seen in this beautiful silver enamelled hookah base.

Betel box from Jaipur in gold with rich enamel. Diamond studded.



There is no doubt that the manufacture of weapons in India, especially of Mughal times, bear foreign influence, mostly Persian and Arabian. Persian weapons are exemplified by fine damascening work, enamelling of the hilts and repousse or carving. Gems are rarely encrusted and when they are, only pearls and torquoises are used. The Arabian arms are devoid of gems but are supreme in their beautiful and delicate filigree work. "No other manufactured article calls into play the use of such varied materials for its decoration, and hence the art displayed in warlike accoutrements deserves special consideration." (Egerton.)

Ornamenting of arms became popular from the beginning of the 16th century onwards and the following few facts chiefly refer to this period.

Floral and geometrical decoration in its purest style is found in the arms manufactured in Kashmir, the North-West States and the Punjab, both East and West, the traditional designs varying slightly from place to place. The most popular motifs are conventionalised from the common flowers and indigenous birds—the lily, the lotus, the peacock and the parrot. Whenever figures, whether human or animal, are depicted the representation is more realistic than the severely conventionalised forms of birds and flowers. This is especially so in the north as compared to the south of India where the figures are more conventional and sometimes even crude. Sometimes figures of gods are engraved even on the flats of the blades, as well as mounted soldiers, the lion and the tiger, hunting and other similar scenes.

The designs of Madhya Pradesh and the Deccan are generally floral and delicate in outline, though during the Muslim regime in the Deccan the designs became bolder and raised patterns, chiselled out of the steel, were popular, exhibiting a definite Persian influence.

The pattern is first engraved in the steel with a fine stylus, punches, etc., all being of a simple character and often quite crude as most of the Indian craftsman's tools are. The gold is drawn into fine wire and gently hammered into the engraved lines of the design. The blade is next heated moderately and finally polished with an agate and cleaned with lime juice. The lines of gold stand slightly superior to the steel background, its glistening and durable beauty lending a peculiar charm to the whole form of decoration.

Enamelling is also quite common on arms and swords and certainly dates from a very early period. The groundwork may be of silver, gold, or even copper. The method of enamelling has been dealt with in a previous chapter and will not bear repetition here. The best form of enamelling of arms came from Kashmir, the North-West States, Delhi, Lahore, Sind, and of course, Jaipur, the homeland of the most exquisite enamelled jewellery. Wilbraham Egerton draws attention to the fact that while the Chinese enamel is very rarely pure white the ground of Jaipur work is usually of a dazzling white. Describing the articles exhibited by the then Maharaja of Jaipur at the Vienna Exhibition of 1873 he says, "The art of enamelling in other parts of India has not attained the perfection reached at Jaipur, but occasionally beautiful specimens may be found, as shown by the sheath of the Gorkha Kukri, enamelled with flowers in brilliant colours on a blue ground exhibited in the Windsor collection."

Decoration of swords and other arms in the Niello style is definitely of Persian origin, and is rather similar to the Tula work of Russia. The design, generally floral or scrolls, is engraved deeply in the basic metal and the lines of the pattern filled in with an alloy of copper, silver and some lead. Heating and polishing follows, after which comes careful burnishing. This mode of decoration is no longer current in India.

The battle-axes used by the scheduled tribes are identical in form with those found among the prehistoric remains in Europe and show the amazing continuity of Indian culture. Maces, battle axes, spears of all varieties, swords, daggers, shields of metal or encrusted with metal, pistols, guns were and still are made in many parts of the country.

enamelled ware

Enamelling may be described as the art of colouring and ornamenting the surface of the metal by fusing over it various mineral substances. The beauty of the article depends on the skill and resources of the worker and the excellence of the materials employed. The range of colours obtainable on gold is much greater than on silver and still more so than on copper and brass. This handicap is, to some extent, overcome by silvering or gilding the surfaces intended to be enamelled.

Three or four forms of enamelling are known to exist. These include the *cloisonne* of Japan and China in which wires are fastened by gum or welded to the surface of the metal in elaboration of the design, as in certain forms of filigree.

*Enamelled brass
vases from
Moradabad.*





*Modern brass enamelled
vase from Moradabad.*

The various spaces thus outlined are next loaded with the colouring material and the article is placed in the furnace until the glasses fuse. The wires prevent the colours from intermingling and blotching the design. This form is not used in India. The engraving tools used are made of steel and the article to be enamelled is first burnished to a fine lustre. The colours are applied in order of their fusibility, those requiring the greatest heat being used first. After each colour has been embedded in the engraved lines or areas, the article is fired. When all the colours have thus been applied and fired, the article is finally polished with corundum and cleaned in strong fruit acid.

Colonel T. H. Hendley, who made a deep study of Indian jewellery, tells us that the engraving for the enamelling is done with steel styles, and the polishing with steel and agate tools. "The surface of the pits in the gold is ornamented with hatchings, which serve not only to make the enamel adhere firmly, but to increase the play of light and shade through the transparent colours. The enameller or minakar now applies the colours in the order of their hardness, or power of resisting fire, beginning with the hardest. Before the enamel is applied, the surface of the ornament is carefully burnished and cleansed. The colours are obtained in opaque vitreous masses. . . ."

He has also recorded: "The design is prepared by the Chitera, or artist, generally a servant of the master jeweller The Sonar, or goldsmith, then forms

the article to be enamelled, and afterwards passes it on to the Gharai, the chaser or engraver, who engraves the pattern. . . . The enameller or Minaker now applies the colours in the order of their hardness, or power of resisting fire, beginning with the hardest." The order of hardness and of application is given as white, blue, green, black, and red.

According to Colonel Hendley, "All colours known can be applied to gold. Black, green, blue, dark, yellow, orange, pink and a peculiar salmon colour, can be used with silver. Copper only admits of the employment of white, black, and pink and even of these the last is made to adhere with difficulty (this applies to Jaipur copper enamels). . . . The pure ruby red is the most fugitive, and it is only the most experienced workman who can bring out its beauties."

The flux used is always borax with the addition sometimes of tin oxide to make the enamels opaque. The colours are silicates and borates of different metallic



Detail of cover of box from Rajasthan. Thin sheet of gold is finely cut with a wealth of detail and placed on green glass.

salts: potassium chromate for yellow, manganese carbonate for violets, cobalt oxide for blues, copper oxide for greens, red iron oxide for browns. These are used with the "glass" made up of about 100 parts of quartz, 50 parts of borax, and 200 parts of red lead. The beautiful white and ivory enamel is made from antimoniate of potash, iron oxide and zinc carbonate mixed with "glass"; but we are not sure of how the Jaipur and Delhi enamellers obtained their brilliant reds.

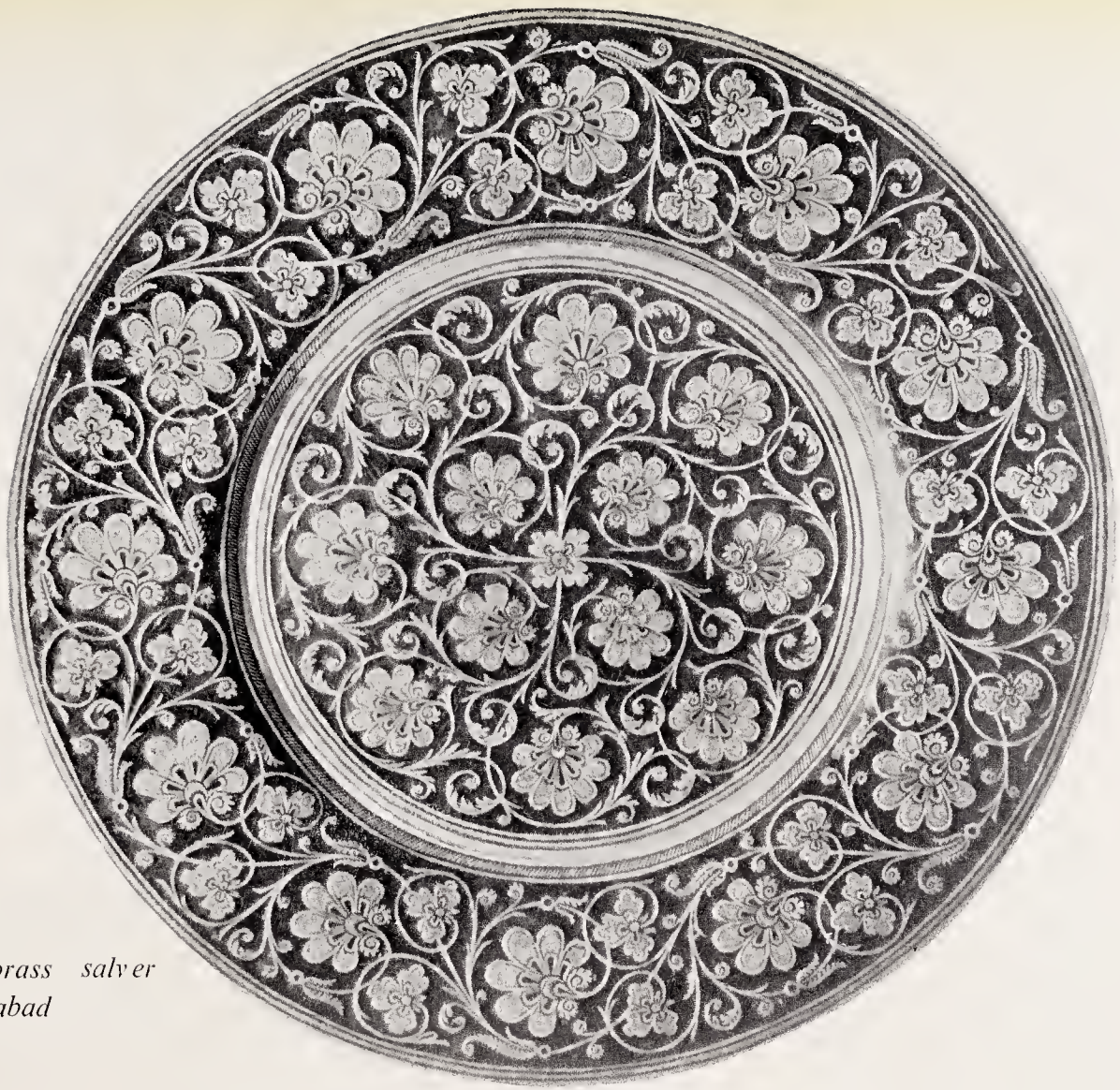
The second form known as *chamleve* is extensively practised in India. In this form the metal is repoussed, chased or blocked providing depressions in which the colours can be embedded. In Jaipur, Kutch, Delhi, Lucknow and Banaras, the pattern is chased while in Kashmir it is blocked out by means of dies.

A third mode which prevails mainly in Kashmir is to paint the surface with a sort of silicated or readily fusible paint and then to expose the article to moderate heat enough to meet the paint but not to cause the colour to fuse together.

The brilliant reds achieved by the Jaipur, Lucknow, and Banaras workmen are the most difficult of all colours to produce and their secret is jealously guarded.



*Enamelled beer
mugs from
Moradabad.*



*Enamelled brass salver
from Moradabad*

White or ivory colour is also difficult, but is obtained from antimoniate of potash, hydrated iron oxide and carbonate of zinc, added to the ordinary glass.

The various styles of enamelling in India are so different that they can be readily recognised. Jaipur stands pre-eminent as the oldest and best school of work. Here the work is done on the purest gold and the plate is so engraved that all but the faintest lines of the metal disappear and the entire surface becomes a sheet of translucent enamel.

In Kutch the whole surface is uniformly coloured, only the faintest lines of gold being left so that the work looks like the finest French cloissone but in design it resembles Kutch embroidery.

In Banaras the enamel is usually employed to give the ground colour required in the production of gold and jewelled articles, and the design is produced with precious stones set within the coloured field.



Enamelled brass vase and kamandal from Moradabad



*Gold and enamel
covered pots.*





Enamelled brassware from Jaipur

In Lucknow is found an etched pattern on silver with green, blue, brown and yellow colours predominating. With small areas in yellow and brown animal forms are a great favourite here with the figure of the fish predominating. The red enamel of Lucknow is also made on the purest gold as it is in Jaipur.

Kangra turns out a crude enamel on silver with the colours blue and yellow predominating.

In Kashmir the enamel on copper and brass is inferior to that on silver. The pattern is punched (repoussé), and the hollows filled with a readily fusible glass paint. Occasionally, instead of gilding the copper prior to enamelling the silversmiths either silver or tin it.

Rampur produces a bold and effective style of enamelling in greens and blues with fairly well-marked spaces of metal.

Pratapgarh in Rajasthan produces a peculiar style of work that is considered to be one of the forms of enamelling. The article is

made of a piece of red or green coloured glass or a thick layer of enamel.

A frame or silver wire, of the exact size and shape of the glass is made and across this is attached a sheet of fairly thick gold leaf. This is then embedded on lac and the pattern is punched out and chased on the gold. The glass is then semi-fused, and while still hot, the rim of silver and film of gold are slipped over the edge and pressed on the surface of the glass. The article is again heated, until a sort of fusion takes place and the gold and glass become securely fixed. Before mounting, a silver tin foil is placed beneath the glass to give it brilliance.

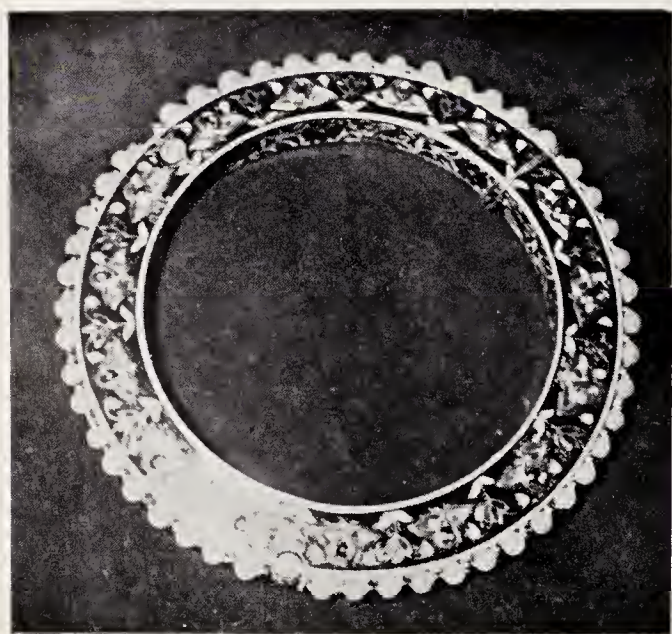
Ratlam produces a similar form of imitation enamelling, the predominant colour being a shade of blue.

In this connection may also be mentioned the lac coloured ware of Moradabad which seems to have been designed as an imitation of 'bidri'. Here the copper vessels are tinned and the background is chased or punched away, leaving the floral ornamentation in relief. The lac was originally dyed black but is now dyed in different colours being then filled into the depressions, and fused by a hot bolt, the excess being rubbed off by sand paper or powdered brick. All kinds of articles of household requirements—ash trays, trays, vases and bowls are produced in this way and are gaining a steady market.



Brass tray table with etched black design and ornamental legs—Made in the Design Centre of the All India Handicrafts Board.

Plate, brooches and bracelet, in shimmering silver filigree from Cuttack



An exquisite gold bracelet, enamelled & stone encrusted from Delhi. The rim is studded with large pearls

jewellery

Indian jewellery presents a dazzling variety of craftsmanship. It also provides a good medium for the examination of the development of culture through the ages. The crude jewellery of the aborigines made of twigs and branches, flowers and leaves is probably an exact copy of the ornaments worn by primitive man. Later, these forms were copied in gold and silver wire by more advanced craftsmen who, not satisfied with the limited range offered to them, turned to their surroundings for inspiration and evolved new forms through the imitation of flowers and animals.

From the neck to the waist hang a profusion of necklaces, all in gleaming silver. Note the necklace of Victoria coins—hard cash and pretty too! From Uttar Pradesh.



*The face is covered
but there is a lavish
array of ornaments
on every part of the
body—A peasant
woman of Rajasthan
proudly displays her
jewellery*



Indian ornaments have existed in almost an unchanging form through the centuries. A small bead necklace found at Mohenjodaro still persists in the same form as the marriage necklace of Coorg while a 'vor' or head ornament found reproduced in pottery at Harappa is still worn in the same form, in gold or silver, enamelled or stone-encrusted, by married women of a certain community in Rajasthan.

The jewellers' and goldsmiths' art in India is of the highest antiquity and forms of Indian jewellery have come down in an unbroken tradition from the Ramayana and the Mahabharata. The Rig Veda also makes constant mention of jewellery. The Maruts decorate their persons with "various ornaments" "they are richly decorated with ornaments" and "shining necklaces are pendant on their breasts." In the Nirukhta, or Etymological Glossary forming one of the Vedangas, and in the grammar of Panini composed about the 4th Century B.C. the names of various ornaments are given. These are identical with those still used throughout the country. The old vocabulary

of Amara Sinha, one of the nine gems of the Court of Vikramaditya, quoted by Rajendralal Mitra, gives a long list of names for crowns, crests and tiaras for the head; of rings, flowers and bosses for the ears; of necklaces of from one to a hundred rows of gems; of all shapes and patterns of armlets and bracelets; of anklets and other ornaments for the legs. All the names mentioned are the ones still used for the same ornaments in India. As primitive probably as the twisted gold wire forms of Indian jewellery, is the chopped gold form of jewellery worn throughout India, the art of which is carried to the highest perfection at Surat and Ahmedabad. It is made of chopped pieces of the purest gold, flat or in cubes, and is worn strung on red silk. This is the finest specimen of archaic jewellery in India and the nail-head earrings made here are identical with those found in Assyrian sculpture.

The brooch worn by the women of Ladakh is identical with the one found among the Celtic remains of Ireland while the waist belt or 'Kardhani' of India recalls the Roman cingulum.

The back of the head is as important as the front and a long plait deserves highlighting, thinks this maiden from the hilly North.





Gold enamelled bracelets and 'hatliphool'—from Jaipur



Necklace and earrings of tiger-nails, beautifully edged with gold, enamelled and encrusted with stones and pearls

The best Indian jewellery of the purest Hindu style of beaten gold is probably made in the South, in Mysore, Vizagapatam and Vizianagaram where the metal is beaten to almost tissue paper thinness without weakening the effect of solidity. By consummate skill the workman imparts to the least weight of metal the highest artistic value, never violating the fundamental principles of ornamental design.

The Indian jeweller thinks mainly of producing the sumptuous, imposing effect of a dazzling variety of rich and brilliant colours. In nothing do the people of India display their naturally gorgeous and costly taste so much as in their jewellery, which is not only fabricated of the richest and rarest materials but is also worked with all the elaborateness, delicacy of art and splendour of design within reach. Megasthenes was struck by the contrast of their love of ornament,

The feet should not be neglected and these ornaments from Andhra Pradesh certainly get them their share of attention.



to the general simplicity of their lives. Jewellery has become an integral part of every festive occasion in India. Negation of splendour during periods of mourning is forcefully emphasised by the removal of ornaments.

Ornaments must, by tradition, be given to every girl at the time of her marriage and if many pieces are beyond the means of the parents, there is one particular piece, which differs from area to area, which must be given at the time of marriage, to be worn continuously until the girl becomes a widow or dies.

In India jewellery is valued not only for ornamental purposes but also as a solid investment. In a country where modern banking facilities did not exist until very recent times, ornaments satisfied both one's sense of vanity and thrift. Their portability made them invaluable during times of crisis when they could be carried on one's person and could be converted into cash as required. Until recently the Hindu woman did not inherit money either from her father or her husband. The only property she could claim as her own was the 'stridhan' or dowry she received at the time of her marriage and the presents she received either from her husband or his people. These usually took the form of ornaments and every woman tried, in her husband's lifetime, to acquire as much jewellery as she could as insurance against hard times. Eventually most of these find their way into the melting pot either to help family finances or satisfy the craving for acquisition of new shapes and meet the demand of changing fashion. It is, therefore, possible to find the earliest forms only in the basest metals which have no intrinsic value and serve only to satisfy the wearer's vanity.

As with other things in India, ornaments have many superstitions attached to them. In certain parts of North India when a man marries a second time, the second wife has to wear a gold or silver plate with the image of the first wife so that the spirit of the first wife will not haunt her. A silver ornament with a plate of gold on it on which is engraved the image of Sitla Devi (the small pox goddess) is given to a child after an attack of small pox to prevent recurrence.

Delhi, Jaipur and Lucknow produce the finest enamel jewellery while Bombay and Madras specialise in highly polished plain gold or stone studded ornaments. Bengal still prefers the delicate jewellery which has its inspiration in the filigree of Cuttack. It is only the fashionable class, however, which has absorbed the new streamlined fashions brought in from the west. Orthodox middle class people and the peasants still cling to the age-old shapes which continue unchanged.



Enamelled jewellery from Jaipur and Delhi. The backs of the ornaments are enamelled while the fronts are stone encrusted.

Intricately wrought choker in gold from Rajasthan





*Enamelled jewellery
set with precious
stones—from Jaipur*

*Modern jewellery—in
gold and precious
stones—from Bombay*



The goldsmith or 'Sunar', as he is called in north India, works entirely with his hands and seldom seeks the aid of machinery. His implements are few and simple but they serve his purpose well. His apparatus for heating and melting consists of the furnace (angithi), crucible (gharya, kutcli), blowpipe (nal phunkari) and the small curved blowpipe (banqual). The furnace is made of an ordinary large earthen-ware pot and the crucible is a small cup of clay.

When the *Sunar* has melted the metal he uses a mould like a long narrow trough with a handle known as "reza" by means of which he reduces it to a form easy to work upon. The metal, when cool, comes out in a long, narrow bar which can be readily cut, bent or hammered as required. For hammering there is the small anvil (nibai) and the hammer (hathaura). He must have long and small tongs (chimta and chimti), large and small pincers

Ornaments for every part of every finger, and upto the elbow are proudly worn by Rajasthan women



*Beads, seeds and
fruits are mixed
with silver to
make up this
profusion of
necklaces from
Andhra
Pradesh*



(sumai, sambur and samburi), scissors (kati), file (sohan or reti) and chisels (chani) of various kinds. An important implement is the janta for drawing wire. It is an iron plate perforated with circular holes of different sizes through which the metal bar is drawn out until it is gradually reduced to the thickness of ordinary wire. A cube (paea or Kandula) of brass or bell metal (kansi) in the side of which there are circular hollows is generally to be found in the *Sunar's* shop. He lays small plates of metal in the hollows and by hammering them moulds in separate halves any round ornaments, such as 'ghungrue' or globular heads which will afterwards form part of a bracelet or anklet. He also requires *thappas* or dies of various kinds shaped according to the nature of the ornaments which they are intended to produce. These dies are used in bringing out the pattern by hammering, after which the metal is set by being put in the fire until it is red hot. The dies have

*Any beauty can be heightened
with this gleaming
silver jewellery*



names taken from various ornaments, e.g., *thappa churi* (bracelet mould); *thappa tawiz* (amulet mould) and so on. Ornaments cast in moulds undergo a different process. A model of the ornament is made from resin which has been boiled with 1/4 of its weight of oil.

No tools are used in making the resin model, which when thoroughly set and hardened, is enclosed in a mixture of clay and cowdung. The clay model thus enclosed is provided with a vent and sealed with clay to the mouth of the crucible containing the metal placed on the fire. When the metal fuses in the crucible, it surges up and the molten metal finding its way through the vent reaches the resin model. This melts and destroys itself by contact with the molten metal which takes its place and form. This results in an exact reproduction in silver or gold of the resin model.

This process which is a crude form of the 'cire perdu' or lost wax process has been in use for centuries and is still widely used.

The *Sunar* uses certain chemicals e.g. *Suhaga* (borax) as a flux in melting metals. To clean and brighten ornaments after they have been made, mango parings (amchur) will probably be used. After this comes an application of salt and ammoniac (Nausadar) and finally, the surface is rubbed with a kind of ruby or red dust known as manik-ret.

The village '*Sunar*' makes the ornaments, engraves them, sets them with stone and finishes them himself but with the more highly sophisticated products of the urban areas, the work is done at different stages by different people. The *Sunar* after preparing the skeleton ornament sends it to the *chatera* for engraving; to the *jeria* for setting with precious stones; to the *meenasaj* for enamelling and so on. This specialisation brings about better finish and produces better results.



*Necklace from Rajasthan
with a pendant of gold
and stone encrusted on
jade*

*Long necklace, choker,
earrings and pendant
from Delhi and Jaipur.
Note the beautiful
enamelling on the back*





*Ruby studded pendant
from the South.*



*Bracelets and turban
ornament (Sarpench).*

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*Copper water containers,
Left Muslim, Right Hindu
—beautifully worked.*



*Container for keeping 'pan'
and spittoon—silver with
diamond cut design—
typically Muslim—from
Lucknow.*





*Brass enamel tray
from Jaipur*

*Silver box—stone studded
and repoussé — 19th
century*





*Bidri tray & box
from Hyderabad*



*Beautifully chased
silver bowl*



*Modern
silver tea set*

ancient
and
modern
sculpture



*Siva and Parvati
bronze—South India.*

Modern metal sculpture.





